The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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British Industries Fair

THE British Industries Fair, which opens on Monday next in London and Birmingham, and will continue open for a fortnight, promises to be at the least as successful as any of its predecessors. There will be over 900 exhibitors in the London Section and over 600 at Birmingham. In the Fair as a whole there will be nearly 1,600 actual manufacturers of British goods displaying their products. Buyers in 34 countries abroad have accepted the Government's invitation to attend. They will represent every country in Europe, the Dominions, the Argentine, Chile, Iceland, and even China. The United States and Holland will probably be among the countries most strongly represented. All the languages will have their interpreters. Wholesale and retail business houses at home have planned "mass attacks" on both sections. One London store alone is sending at least fifty buyers. An overseas buyers' club will be provided at the White City, and officials of the Department of Overseas Trade will be in attendance all day to help buyers. The arrangements are again being organised by Mr. Claude Taylor, of the Overseas Department.

The Chemical Section will again be in the competent hands of the Association of British Chemical Manufacturers, and satisfactory arrangements are thus guaranteed. The chemical and allied products on view will be generally representative. There will be sections illustrating the British output in analytical and research chemicals, disinfectants, dyes and intermediates, fertilisers, heavy chemicals, insecticides, photographic chemicals, soaps, cleansing and laundry preparations, polishes, drugs, pharmaceutical products, perfumes, essences and essential oils, veterinary medicines, etc. Nearly all the well-known manufacturing chemical firms are represented in one or more of these departments, and together, the exhibits should give a good collective idea to foreign buyers of what this country is now doing.

As regards the London section, the stand of Imperial Chemical Industries, Ltd., promises to be the dominating feature. The exhibit might indeed almost be described as an edifice rather than a stand. The casual visitor will be able to see at a glance the widespread influence this huge concern exerts upon the life of the community and upon trade in general. Indeed it has been difficult for Imperial Chemical Industries with their enormous interests in trades of all kinds to avoid showing in London some exhibits which in a sense properly belong to the Birmingham section. Thus manufacturers of metal and metal goods are themselves huge consumers of chemicals of various kinds, *e.g.*, sulphuric and nitric acid. Sulphuric and nitric acids may not in themselves make an appeal to metal workers and engineers interested in their own trade, but when they see them coupled with articles of brass or brass sheet and other non-ferrous metals, the connection becomes apparent. Lime and limestone are also used in large quantities in foundries and smelting works. The agriculturist may not at once see the relationship between chemicals and the plough, but associated with Imperial Chemical Industries is Nitram, Ltd., the newly-formed company who are acting as sole agents not only for the British Sulphate of Ammonia Federation, but also, we understand, for other fertilisers, etc., for Imperial Chemical Industries. This concern will have an attractive display showing the use of chemicals in the production of foodstuffs and cereals of all kinds as well as vegetables, while the indirect effect chemicals have through fertilising meadowland upon butter, milk, and meat production will be seen. The organisers of the stand are taking advantage of the fact that the British Industries Fair will be open to the public after 5 o'clock, and are putting up an exhibit that will not only appeal to the trade buyer during the daytime but to the public in the evening.

Professor Armstrong's Memories

"I BEGAN the study of chemistry in 1865 under Hofmann, shortly before he left England." Sixty-two years ago! A touch of emotion must surely come to every chemist who reads that sentence, written by Professor H. E. Armstrong in an article published in the current *Chemiker-Zeitung*, on his memories and opinions of German chemistry. He has lived through the whole rise and development of the science as we now know it, and the mere enumeration of his teachers and associates is an epitome of much that is best in it. After leaving Hofmann, he assisted the elder Frankland in the determination of the organic matter in drinking water. In 1868, he went to Germany, to work with Frankland's friend Kolbe, at Leipzig, his first investigation under the eye of the latter being a study of *o*-phenolsulphonic acid. In this laboratory he rubbed shoulders with men whose names enrich the history of chemistry. Graebe was there, as a Privatdozent (he "had a bench near mine"); among the others were Hüfner and Ludwig Darmstaedter. At Leipzig Professor Armstrong forged a link with the distant past in his friendship with Liebig's nephew, Karl Knapp. Returning to England, he renewed and cemented his acquaintance with Peter Griess, then chemist at Allsop's brewery, Burton-on-Trent. Griess introduced him to Heinrich Caro, who, coming on a visit to Griess, received from the latter's work a stimulus that afterwards had important repercussions on the azo-dyestuff industry. About this time Professor Armstrong met Lunge and Otto Witt, the latter being then engaged in manufacturing the Tropæoline dyestuffs at the factory of Williams, Thomas, and Dower, in the neighbourhood of London; and in 1883 occurred his first meeting with Emil Fischer.

A perusal of this short account of Professor Armstrong's early chemical life justifies his statement that to a large extent he was "made in Germany," and shows his unique capacity to judge and criticise the development of chemistry in that country. His view of modern chemistry in general and of German chemistry in particular is not altogether favourable. He agrees that there have been wonderful technical developments, but points out that the effects of the growth of the science on social and intellectual life, which might have been looked for, have not been forthcoming. Of Hofmann he says: "A courtier and diplomat of the first rank, endowed with great literary skill, he not only assisted in technical advances but had also a decided social influence. Chemistry to-day is more in need of men of his type, with great social gifts, than of those with only technical experience. Chemists are becoming a race apart, with little influence on spiritual life and public opinion. Technical knowledge alone is calculated to narrow, if not to sterilise, the broad spiritual view."

Professor Armstrong is very definite in his views of the mutual reactions of chemical science and industry in Germany. In his student days "chemistry in Germany was still an independent science, which was not controlled by industry. . . . In the application of chemistry to industry there has been an extraordinary advance. On the academic side I incline to the belief that a decided retrogression is to be seen. . . . In many respects chemistry lacks *morale*, and it has certainly become too speculative. As in religion, we are split into too many churches. . . . Academic chemistry has been commercialised. . . . The works laboratories have now long been the true centres of advance, where work is not only done with scientific exactitude, but also with real logical aim, zeal, and method. . . . Our knowledge of the branches which have not been exploited commercially is deficient and uncertain." As regards chemistry in the universities, Professor Armstrong regrets that, in spite of the real value of mathematics, the mathematical mode of thought, so foreign to the work of the chemist, should have been introduced into the discipline, and he deprecates the influence of the physico-chemical school. "Six months spent in the determination of electrical conductivity is not chemical work, and this is true of most physical tasks." Early specialisation he regards as evil; the fundamentals of the subject must be properly developed. "We must bring the chemists back again to facts and to analysis." If Germany is to retain her position in chemistry, "she will have to strengthen her academic system, so that the development of chemistry becomes far more earnest and fundamental, far more honest and logical, not speculative and superficial."

A study of this fascinating article leaves one again wondering whether Professor Armstrong could not yet give us a volume of memories under some such title as "Fifty Years of Chemistry." To chemists young and old, and indeed to the cultured public at large, it might be one of the great books of its class. He is almost the last survivor of a great scientific period, and none could paint its characters and ideas with such intimate knowledge and in such vivid colours.

Chemistry and Empire Trade

SIR MAX MUSPRATT, in his excellent address to the Royal Colonial Institute on Tuesday, went at once to the real secret of things in his statement that "the fundamental thing is research"; the best organisation and utilisation of existing resources are of course necessary, but the fresh starting points for new developments come from the laboratory, and only by feeding the very springs of progress can progress be reasonably hoped for. He acknowledged the great work being done in the universities overseas, but for many years, he emphasised, Great Britain must remain the clearing house of research for the English-speaking world.

One of the great barometers of the prosperity of industry generally, he reminded us again, is the chemical industry. Fabrics, soap, fertilisers, the latter of which play so great a part in the agricultural development of the Empire, all the necessities for cleanliness, shelter and adornment, are dependent to a great extent on the chemical industry. What has Great Britain done in regard to the industry? In the early days of the war, we were told there was no chemical industry in this country. Actually, although there were some branches in which we were a little deficient, and although some great discoveries made in this country were developed a little more rapidly in other countries, we had always been the greatest exporters of chemicals in the whole world. Not only were our exports greater than those of any other

country, but they were almost greater than those of all other industrial countries taken together. In the past the close proximity of coal to other raw materials necessary to the chemical industry has been our great asset, but raw electricity derived from water power is now in many ways replacing coal in many branches of the chemical industry.

Sir Max once again emphasised the fact that, however much we desire to develop trade with other countries, the British Empire itself is the most valuable market—per head of population—to the chemical industry. He gave two sets of figures to illustrate that. China has fifty times as many people as Australia, yet the chemical products bought from this country by China are only one-third more than those bought by Australia. We should like to develop business with China—it was a remarkable fact that, despite the troubles in China, the consumption of chemicals in that country had increased—but obviously, in view of the higher standard of living in Australia, an increase of population there must make Australia potentially an infinitely greater consumer of our chemical products. The fullest development of every part of the Empire and the fullest confidence between those various parts must obviously be, as he pointed out, for the good, not only of the chemical industry, but of the whole of our commerce, shipping, finance, and other services. His final word was that as far as the great merger with which he was connected is concerned, the Imperial Chemical Industries are taking the broadest and widest views both industrially and scientifically. In thus bringing the work of chemical industry before the attention of the Colonies and the heads of industry generally Sir Max Muspratt and other chemical leaders are doing a real service to both sides.

Chemical Overseas Trade

ALTHOUGH the chemical trade returns for January show an increase in imports and a decrease in exports and re-exports as compared with January of 1926, the results are only what may reasonably be expected. The past month's returns reveal the obvious influence of the long coal stoppage, which compelled increasing imports of many necessities and correspondingly hampered our export trade. One item alone brings out this fact strikingly. The imports of coal tar products, which in January of 1926 stood at £47,423, rose in January of this year to £194,460—practically four times the value.

Turning to the export side, there are increases in a number of items—bleaching powder, copper sulphate, distilled glycerine, potassium compounds, sodium compounds, and paints. The decreases, however, are heavy. The most serious is in sulphate of ammonia, the total export of which is £97,193, against £290,375 a year ago. The export to Spain and the Canaries has fallen from £70,927 to £23,230, to Italy from £7,939 to £4,363, to Dutch East Indies from £76,476 to nil, and to Japan from £69,825 to £5,978. Coal tar products have declined from £215,547 to £103,136. There is a particularly heavy drop in benzol and toluol (from £30,712 to £2,966) and in tar and creosote oils (from £141,388 to £47,239). Dyes and dyestuffs show a reduction, but not to any serious extent. The conclusion to which any detailed study of the figures leads is that the loss is to be found in the products of coal, and that every effort must be made to secure a stable peace and hearty co-operation in order to recover the lost ground.

Books Received

LES ETABLISSEMENTS KULHMANN. 1825-1925. Centenary Volume. Paris: Etablissements Kuhlmann.

COURS DE CHIMIE INORGANIQUE. By Fréd. Swarts. Brussels: M. Lamertin, 58-60, Rue Coudenberg. Frs. 72.

The Calendar

Feb. 19	British Association of Chemists: Sixth Annual Dinner. 6.30 p.m.	Engineers' Club, Coventry St., London.
19	North of England Institute of Mining and Mechanical Engineers: General Meeting. 2.30 p.m.	Newcastle-upon-Tyne.
Feb. 21 to Mar. 4	British Industries Fair.	Castle Bromwich, Birmingham, and White City, London.
Feb. 22	Royal Photographic Society (Scientific and Technical Group). 7 p.m.	35, Russell Square, London.
23	Royal Society of Arts: "Insulin and its Manufacture." F. H. Carr. 8 p.m.	John Street, Adelphi, London.
23	Institute of Chemistry (Belfast Section): "Primitive Australia." Professor Gregg Wilson. 7.30 p.m.	Royal Belfast Academical Institution.
23	Electroplaters' and Depositors' Technical Society: "Electro-deposition of Iron." T. Johnson. 8.15 p.m.	Northampton Polytechnic Institute, St. John Street, London, E.C.1.
23	Northampton Engineering College Engineering Society: Walmsley Memorial Lecture: "Fuels and The Internal Combustion Engine." Dr. W. R. Ormandy. 4.15 p.m.	Northampton Engineering College, St. John Street, London, E.C.1.
24	Oil and Colour Chemists' Association: "Further Notes on the Behaviour of Phenolic Resins." A. A. Drummond.	8, St. Martin's Place, Trafalgar Square, London.
24	Chemical Society: Anniversary Dinner. 7 p.m.	Hotel Victoria, Northumberland Avenue, London.
25	Institute of Brewing: "Horace Brown Memorial Lecture." Professor H. E. Armstrong. 8.15 p.m.	Institution of Electrical Engineers Theatre, Savoy Place, London, W.C.2.
26	North of England Institute of Mining and Mechanical Engineers: "Winning Thin Seams of Great Britain." W. Leebetter. 3 p.m.	Neville Hall, Newcastle-upon-Tyne.
28	University of Birmingham Chemical Society. Presidential Address: "Some Hetero-cyclic Compounds." Professor W. N. Haworth.	University, Birmingham.
28	Sir John Cass Technical Institute: "Pulverised and Colloidal Fuel." Leonard C. Harvey. 6 p.m.	Jewry Street, Aldgate, London.
28	Society of Chemical Industry. Joint meeting of the Yorkshire Section and the Fuel Section. 2.30 p.m.	Queen's Hotel, Leeds.
Mar. 1	Institute of Metals (N.E. Coast Section): Annual General Meeting. 7.30 p.m.	Armstrong College, Newcastle-upon-Tyne.
1	Hull Chemical and Engineering Society: "Stainless Steel." Dr. W. H. Hatfield. 7.45 p.m.	Grey Street, Park Street, Hull.
2	Royal Society of Arts: "The Corrosion of Metals at Joints and Crevices." Ulick R. Evans. 8 p.m.	John Street, Adelphi, London.
2	Society of Public Analysts. 8 p.m.	Burlington House, Piccadilly, London.
3	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, London.
3	Staffordshire Iron and Steel Institute, Birmingham Metallurgical Society and the Institute of Metals: "Metal Melting Furnaces." Dr. E. W. Smith. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham.

The Conversion of Coal into Oil

By Stanley C. Bate, B.Sc., F.I.C.

THE importance of the petroleum question has greatly increased during the last decade, owing to the considerable increase in the technical use of oil and the alteration in the fuel markets of the world after the war. Both the production and the consumption of oil have enormously increased during the past ten years. The world's production in 1913 was 53 million tons; last year it reached 151 million tons. In this connection it is instructive to compare the figures of consumption of petroleum per head of population in different countries.

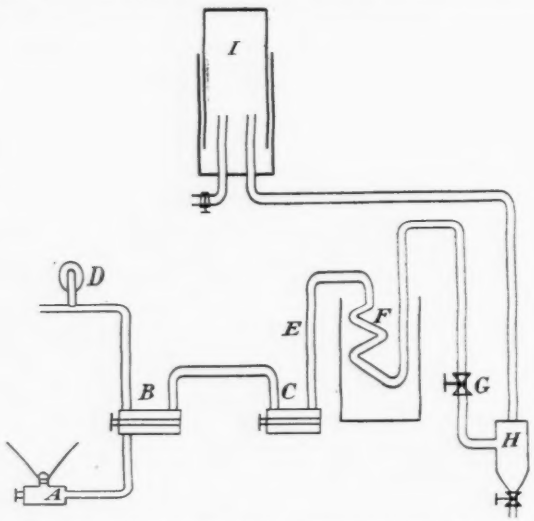


FIG. 1. DIAGRAM OF COAL BERGINISATION PLANT

These were, in 1923, in the United States, 1,530 lb.; in England, 216 lb.; in France, 86 lb.; and in Germany only 22 lb.

Oil has secured an extensive application as a fuel for shipping; in 1914, 96·6 per cent. of the whole world's tonnage was fired with coal as against 68·3 per cent. in 1925. At the same time the number of oil burning ships rose from 2·9 per cent. to 27·4 per cent., while the motor ships increased from 0·5 to 4·3 per cent. With reference to these figures, it is noteworthy that, in addition to the advantages inherent in using a liquid fuel, the great boiler power, cheap upkeep, and economy of labour have caused the number of ships driven by Diesel motors to be a continually increasing quantity. It must also be pointed out that the petroleum question has a political side, for those countries which have at their disposal a supply of petroleum, whether natural, as heretofore, or manufactured, as is possible in the future, are free from certain anxieties which press on less favoured nations, without any source of this valuable commodity.

The Nature of the Problem

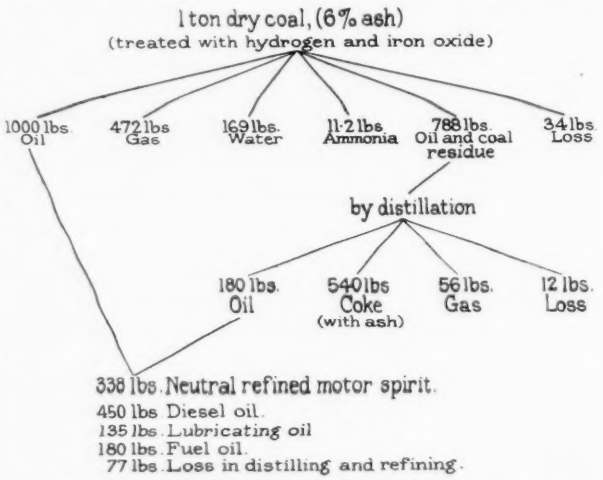
In coal, the proportion of hydrogen to carbon is, on the average, 1 to 16, but in petroleum it is nearly 1 to 8. The content of hydrogen in coal must therefore be doubled when the coal is converted into oil. If the coal is to be economically transformed, it is essential that the oil shall not be a mere by-product, considering the great amount of oil that must be produced. The vast increase in the consumption requires that by such a process for the manufacture of oil the latter must be the sole product, or, at least, the product obtained in by far the greatest quantity. The making of coke from coal, for instance, gives considerable quantities of liquid fuel, benzene, and similar compounds. In consequence of the extraordinary growth of this industry in the last decade, the oily by-products have certainly attained a considerable importance in the financial calculations of the coal carbonisation industry, but still the production is only trifling compared with the demand for oil.

Attempts to obtain any practical form of liquid fuel from coke appear likely to fail, partly owing to the high cost of coke. Up to the present, only the dearer grades of coke can be used as a source of water gas, that is, a mixture of carbon monoxide and hydrogen; the I.G. in Germany has, it is true, converted this gas catalytically under high pressure into methyl alcohol, but it must not be forgotten that this substance is then used, not as a fuel, but as a solvent, etc., in the dyestuff industry. Whether it might be practically possible to obtain hydrocarbons from water gas without employing high pressures is somewhat doubtful, in spite of the favourable researches of Franz Fischer. It appears that 10 cubic metres of water gas are necessary for the production of 1 kilogram of oil; the gas must, in addition, be purified very carefully; the catalysts, which mostly consist of chromium compounds, are somewhat costly in themselves; all these facts lead to the belief that considerable economies must be made in this process before it can be considered a satisfactory one, unless, indeed, the price of oil goes up still further, which is not unlikely.

The practicability of the Fischer process seems doubtful, because, chemically, it appears to employ a circuitous route; it drives out the carbon-bound hydrogen of the mineral oil by the coking process, it unites oxygen with carbon in the water gas process, and then it unites hydrogen once more with the carbon in the catalytic process. Therefore it would appear that the employment of large volumes of gas under atmospheric pressure is not suitable to this type of work, which is in full accordance with the known fact that the difficulty of heat transference in gases greatly increases with the volume.

The Hydrogenation of Coal

A high pressure process for the preparation of oil from coal, which can be worked with almost any coal as starting material, is direct hydrogenation by the action of hydrogen at a high temperature and pressure. This was carried out for the first time thirteen years ago by Friedrich Bergius, who used a two litre steel bomb, in which was placed finely powdered coal previously mixed with a little oil. Hydrogen was pumped in at a pressure of over a hundred atmospheres, and the whole was heated for a long time at a temperature


1 ton dry coal, (6% ash)
(treated with hydrogen and iron oxide)
1000 lbs. Oil
472 lbs. Gas
169 lbs. Water
11·2 lbs. Ammonia
788 lbs. Oil and coal residue
34 lbs. Loss
by distillation
180 lbs. Oil
540 lbs. Coke (with ash)
56 lbs. Gas
12 lbs. Loss
338 lbs. Neutral refined motor spirit.
450 lbs. Diesel oil.
135 lbs. Lubricating oil
180 lbs. Fuel oil.
77 lbs. Loss in distilling and refining.

YIELDS OBTAINED ON BERGINISING A TYPICAL COAL

of over 450° C. Two conditions were found to be essential for the success of the hydrogenation reaction, namely, the preservation of a high pressure, and of a known and constant temperature. These two conditions were difficult to fulfil, for the reason that the reaction itself gave out heat; it was for this reason that the oil was introduced with the coal, as it made it possible to obtain an even distribution of heat over the mass of coal. The research with the two litre bomb showed that the hydrogenation reaction may be carried out with almost every variety of coal except anthracite, but that every

sort of coal has its own optimum conditions of reaction. These small bomb experiments therefore afford a useful scientific means of obtaining fresh physico-chemical information about coals.

The original study of the hydrogenation reaction in the little two litre bomb was the forerunner of a technically valuable process, that should make the uninterrupted hydrogenation of coal a possibility on a large scale. It was at this stage that the first real difficulties began, for it was necessary to introduce the coal, a solid substance, continuously under high pressure into the reaction vessel, and, on the other hand, to abstract the oil obtained, the small undecomposed coal residue, and the ash. This purely technical problem was solved in a year's work. The finely powdered coal was stirred to a plastic mass with a small quantity of a heavy oil—itself previously prepared by the Berginisation process—and also a little iron oxide, to combine with the sulphur present in the coal. This mixture could then be driven by a pump like a liquid. By this means, the oil, which in the small scale experiments was only necessary as a heat distributor, had a further function. It was practicable to pump the paste, and this made possible the continuity of the process.

Plant Used in the Berglus Process

The accompanying diagram, Fig. 1, shows the arrangement of the plant used in this process. The coal paste is introduced by means of the press A into the pre-heating vessel B, whilst, on the other side, the pump D introduces the hydrogen. The reacting substance leaves the pre-heater B after good mixing with the help of an agitator, to pass into a similar reaction vessel C, where the hydrogenation takes place. Through the exit tube E the products of the reaction pass to be cooled in a cooling coil, and then through the valve G to be liberated. The products pass into the vessel H, where the gaseous, liquid, and solid substances are separated and the gas passes to a special holder I.

The half-scale plant serves principally to demonstrate the behaviour of the different varieties of coal in the continuous process. The full scale unit differs from the half-scale plant in very little but the measurements; for in place of the reaction vessel of about 13 to 14 gallons capacity, there is used one with a diameter of 32 in., and a length of 27 ft. These increased proportions do not introduce any element of danger, for the reaction vessel itself has to stand no high pressures; the inner hydrogen pressure is equalised by the outer equally high pressure of a chemically indifferent gas, used for the purpose of heating, such as nitrogen or carbon dioxide. This pressure acts on an outer covering tube, which thus comes in contact with no inflammable or chemically active substance, so that by means of this the danger of explosion is greatly diminished.

The yields of the various products of hydrogenation are as in the attached flow-sheet. It will be noticed that coal gives by the hydrogenation process considerably more ammonia than by the ordinary gas manufacture process.

Paint Firm's Voluntary Liquidation

A MEETING of the creditors of F. A. Gent and Co., Ltd., paint and varnish manufacturers, Barton Works, Barton Lane, Stretford, was held recently, at the Houldsworth Hall, Deansgate, Manchester, when Mr. E. Williams, of Knutsford Road, Alderley Edge, the liquidator, presented a statement of affairs which showed liabilities of £1,316 17s. 3d. The net assets were £825 12s. 7d., or a deficiency of £491 4s. 8d.

It was reported that the company had also carried on business at a branch shop at Irlam, which was being continued for the time being as the sales there had been satisfactory. The business had been in existence for some time, but the company was only registered in March of last year, with a nominal capital of £1,000. Shares to the value of £500 were issued to the vendor, whilst the remaining shares were allotted for cash. Apparently there had been a loss on the trading of £516, and the deficiency as regarded the shareholders was accounted for by that loss, together with the writing off of the goodwill of £511 14s. 8d., and the depreciation of the assets in the statement of affairs.

A resolution was passed confirming the voluntary liquidation of the company, with Mr. Williams as liquidator, whilst an advisory committee was appointed.

The Borough Polytechnic

Distribution of Prizes

THERE was a large attendance at the Borough Polytechnic Institute, when the prizes and certificates were distributed to the successful students, numbering some hundreds, by Sir Arnold Gridley.

The Principal (Mr. J. W. Bispham) presented the annual report at the request of the Chairman (Mr. D. Clifford Highton). There were, he stated, over 3,000 evening students during the year, whilst there were over 7,000 class entries and nearly 200,000 hours of evening student work were put in. The chemistry and engineering departments jointly provided a new course for gas engineering apprentices.

Sir Arnold Gridley, before presenting the prizes, said that they were presumably evidence that the successful ones had favourably impressed that unpleasant body of men—the examiners. He hated examinations, and they were an abomination to him. There were a number of people who did badly at examinations, as fright seemed to paralyse their brains. Sir Arnold then presented the prizes and certificates, which included the following:—

National Certificate in Chemistry. Ordinary Certificate—Abbott, William J.

Evening exhibitions in art, science and technology extensions, 1926. Chemistry—Reuben J. Woodford.

"Thomas Greenwood" Prize in painters' oils, colours and varnishes, value £2 2s. Final Grade, Walter B. Peacock; Grade 1, Cecil W. A. Mundy.

Paint Technology (1923) Scholarship. Albert E. Cameron.

The City of Guilds of London Institute list of passes in painters' oils, colours and varnishes, and chemistry were as follows:—William J. Abbott, Higher National Certificate in chemistry, including inorganic, organic and physical chemistry; Harry W. J. Breeze, 1st year interim course certificate in chemistry, including inorganic chemistry, introductory physics, and 2nd year general mathematics; William Brett, 2nd year chemistry; Frederick J. Chopping, 6th year chemistry; Sidney J. Cloke, 3rd year interim course certificate in chemistry, including inorganic chemistry, and heat, light and sound; Francis Downing, 5th year interim course certificate in chemistry, including mathematics; 6th year chemistry (theory); Charles A. Fincham, 2nd class final painters' oils, colours and varnishes; Ada Gamble, 4th year organic chemistry; Ralph Greenslade, 2nd year interim course certificate in chemistry, including chemistry and general mathematics; 2nd Division London Matriculation; Arthur H. J. Griffin, Institute Diploma of 1st class final painters' oils, colours and varnishes; George A. Hacker, 1st year engineering drawing, 3rd year foundry equipment, and chemistry of metals; Howard H. Hunter, 2nd year chemistry; Thomas E. Jones, 1st year interim course certificate in chemistry, including introductory physics, 3rd year chemistry; Alan C. Keir, 3rd year chemistry of metals and mathematics; Edward A. Kennaird, 4th year organic chemistry (theory); Herbert R. Miller, 1st year interim course certificate in chemistry, including practical mathematics; 2nd year chemistry; Cecil W. A. Mundy, 1st year pigments and colours and varnishes, Thomas Greenwood Prize; Herbert Murcutt, 2nd year interim course certificate in chemistry, including practical mathematics; 1st year magnetism and electricity (chemical course); 4th year inorganic chemistry; George W. Nunn, 1st year chemistry, and 3rd year practical mathematics; Walter B. Peacock, 1st class final grade painters' oils and colours, Thomas Greenwood Prize; Stanley Pinfield, 3rd year interim course certificate in chemistry, including chemistry, and heat, light and sound; Bertram Pleasance, 3rd year practical mathematics; 6th year chemistry (theory); Cecil M. Roberts, 1st year interim course certificate in chemistry, including practical mathematics; 2nd year chemistry; William Sparkes, 1st year interim course certificate for gas workers, including chemistry and physics; James J. Taylor, 2nd year chemistry; Lionel S. Thompson, 2nd year chemistry; William Underwood, 3rd year chemistry of metals, foundry equipment, and 1st year practical mathematics; J. Reuben Woodford, 1st year interim course certificate in chemistry, including general mathematics; 2nd year chemistry; Robert J. Woolley, 3rd year foundry equipment and chemistry of metals.

Chemical Trade Returns for January
Further Decreases in Exports

THE Board of Trade returns for January show an increase, as compared with the corresponding month of 1926, of £348,302 in imports of chemicals, drugs, dyes, and colours, a decrease of £286,560 in exports, and a decrease of £22,197 in re-exports. The detailed figures are given below :—

Imports

	Quantities. 1926.	Quantities. 1927.	Value. 1926. £	Value. 1927. £
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Acetic .....tons	553	974	26,758	41,864
Acid Tartaric ...cwt.	3,048	1,858	14,770	8,873
Bleaching Materials ,,	7,992	11,833	5,755	9,324
Borax ..... ,,	9,390	4,140	9,850	4,822
Calcium Carbide.. ,,	88,147	99,009	57,433	40,524
Coal Tar Products, not elsewhere specified value	—	—	47,423	194,460
Glycerine Crude cwt.	—	2,095	—	8,603
Glycerine Distilled ,,	130	45	493	178
Red Lead and Orange Lead .....cwt.	4,759	3,877	9,522	7,350
Nickel Oxide ... ,,	—	—	—	—
Potassium Nitrate (Saltpetre) cwt.	4,358	13,170	4,865	13,444
Other Potassium Compounds .....cwt.	275,001	420,887	77,986	105,294
Sodium Nitrate ...,,	83,191	101,065	51,932	62,440
Other Sodium Compounds .....cwt.	21,311	44,494	18,811	28,527
Tartar, Cream of . ,,	5,090	5,570	18,155	19,763
Zinc Oxide .....tons	880	1,599	30,671	54,381
All other sorts .value	—	—	283,871	312,347
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts..... oz.	115,337	158,007	11,564	11,876
Bark Cinchona ..cwt.	312	1,804	1,509	7,314
Other sorts.....value	—	—	99,434	115,601
DYES AND DYESTUFFS, ETC.—				
Intermediate Coal Tar Products.....cwt.	174	12	1,283	265
Alizarine ..... ,,	174	154	7,484	5,501
Indigo, Synthetic ,,	—	—	—	—
Other sorts ..... ,,	4,842	4,054	66,386	93,652
Cutch ..... ,,	7,470	3,096	12,351	5,290
Other dyeing extracts .....cwt.	1,811	3,447	8,231	9,466
Indigo, Natural .. ,,	—	5	—	125
Extracts for Tanning cwt.	125,121	133,094	115,222	135,193
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground, and Blanc Fixe ...cwt.	53,381	64,587	12,908	14,623
White Lead (dry). ,,	11,351	11,163	23,254	20,196
All other sorts .. ,,	79,371	101,889	106,542	135,469
Total of Chemicals, Drugs, Dyes and Colours, ..value	—	—	1,124,463	1,472,765

Exports

CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid Sulphuric ..cwt.	12,440	1,318	6,444	2,224
Acid Tartaric .... ,,	1,154	1,133	6,410	6,088
Ammonium Chloride (Muriate) .....tons	363	190	9,898	5,348
Ammonium Sulphate—				
To France ....tons	—	—	—	—
Spain and Canaries tons	5,505	1,993	70,927	23,230
Italy..... ,,	633	384	7,939	4,363
Dutch East Indies tons	5,943	—	76,476	—
Japan..... ,,	5,430	499	69,825	5,978
British West India Islands and British Guiana tons	445	186	5,672	2,424
Other countries tons	4,824	5,452	59,536	61,198
Total.....tons	22,786	8,514	290,375	97,193

Re-exports

	Quantities. 1926.	Quantities. 1927.	Value. 1926. £	Value. 1927. £
Bleaching Powder..cwt.	28,559	40,035	13,931	17,809
COAL TAR PRODUCTS—				
Anthracene .....cwt.	1,260	21	490	14
Benzol and Toluol galls.	357,527	18,861	30,712	2,966
Carbolic Acid....cwt.	13,862	8,371	20,487	15,757
Naphtha .....galls.	18,363	1,288	1,658	149
Naphthalene .. cwt.	4,724	1,475	1,741	718
Tar Oil, Creosote Oil, etc. .....galls.	4,648,484	1,414,023	141,388	47,239
Other sorts.....cwt.	32,790	76,082	19,071	36,293
Total....value	—	—	215,547	103,136
Copper, Sulphate of tons	1,853	2,114	43,600	44,814
DISINFECTANTS, ETC.cwt.	32,709	36,403	78,591	90,433
GLYCERINE—				
Crude .....cwt.	6,099	799	18,312	3,224
Distilled ..... ,,	16,138	14,109	64,577	70,983
Total.....cwt.	22,237	14,908	82,889	74,207
POTASSIUM COMPOUNDS—				
Chromate and Bichromate .....cwt.	990	4,089	1,853	7,079
Nitrate (Saltpetre) ,,	1,221	855	2,461	1,703
All other sorts .. ,,	1,534	1,127	12,459	10,515
Total.....cwt.	3,745	6,071	16,773	19,297
SODIUM COMPOUNDS—				
Carbonate, including Soda Crystals, Soda Ash and Bicarbonate .....cwt.	391,488	400,504	117,367	122,138
Caustic..... ,,	151,267	134,246	106,127	103,819
Chromate and Bichromate .....cwt.	2,422	1,831	3,753	2,569
Sulphate, including Salt Cake ....cwt.	45,219	37,748	5,738	5,555
All other sorts .. ,,	41,897	47,573	47,906	54,421
Total.....cwt.	632,303	621,902	280,891	288,502
Zinc oxide .....tons	255	47	8,556	2,115
CHEMICAL MANUFACTURES, ETC., all other sorts...value	—	—	270,869	276,278
Total of Chemical Manufactures and Products (other than Drugs and Dyestuffs) value	—	—	1,324,774	1,027,344
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts..... oz.	110,204	126,709	15,521	13,834
All other sorts..value	—	—	223,056	209,655
Total....value	—	—	238,577	223,489
DYES AND DYESTUFFS—				
Products of Coal Tar cwt.	8,664	5,258	57,681	52,370
Other sorts ..... ,,	3,598	5,848	5,814	7,046
Total.....cwt.	12,262	11,106	63,495	59,416
PAINTERS' COLOURS AND MATERIALS—				
Barytes, ground..cwt.	5,897	1,243	2,274	642
White Lead (dry). ,,	4,174	3,234	10,179	6,752
Paints and colours, in paste form.....cwt.	43,647	51,487	99,584	113,775
Paints and Enamels prepared (including Ready-mixed)..cwt.	26,980	31,015	91,396	102,135
All other sorts .. ,,	44,351	50,259	89,146	99,312
Total .....cwt.	125,049	137,238	292,579	322,616
Total of Chemicals, Drugs, Dyes, and Colours ....value	—	—	1,919,425	1,632,865

Re-exports

	Quantities.		Value.	
	1926.	1927.	1926.	1927.
CHEMICAL MANUFACTURES AND PRODUCTS—			£	£
Acid Tartaric ....cwt.	58	50	406	323
Borax..... ,,	4	13	4	13
Coal Tar Products not elsewhere specified value	—	—	175	628
Glycerine, distilled cwt.	—	—	—	2
Potassium Nitrate ,,	31	79	52	134
Sodium Nitrate .. ,,	7,625	83	4,649	56
Tartar, Cream of.. ,,	199	1,012	879	3,899
All other sorts ..value	—	—	13,559	8,728
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	14,288	13,280	2,114	1,526
Bark Cinchona ..cwt.	74	496	460	3,707
All other sorts ..value	—	—	30,141	39,795
DYES AND DYESTUFFS—				
Cutch .....cwt.	1,280	877	2,170	1,341
Other Dyeing Extracts ..... ,,	207	68	2,522	932
Indigo, Natural .. ,,	6	2	198	48
Extracts for Tanning cwt.	14,333	789	13,693	1,121
PAINTERS' COLOURS AND MATERIALS ..cwt.	8,388	6,140	18,586	5,539
Total of Chemicals, Drugs, Dyes and Colours .... value	—	—	95,724	73,527

Organic Colours for Rubber

A New Series of Products

THE old method of colouring rubber (writes a correspondent in the *Manchester Guardian Commercial*) was to incorporate inorganic pigments such as the sulphides of antimony or mercury or the oxides of certain metals. The colouring power of these substances is low, and large amounts are needed to produce any depth of colour; even then the shades are dull. These inorganic pigments are now being replaced by the Vulcafor colours, which are organic dyes suitable for rubber. Two main classes are available, those soluble in water and those which are insoluble. Vulcafor Red III, Yellow I and Yellow IV are soluble in water, and Vulcafor Red, Scarlet, Orange, Green L, Yellow G, Yellow 5G, and Blue are insoluble.

The application of the water-soluble varieties is somewhat limited, and it is customary to apply the dye in the form of a lake or to colour the filler, such as China Clay, with the water solution of the dye. The ideal dyes for rubber are those which are insoluble in it, as these can be mixed directly into the rubber and there is no danger of bleeding from one piece of rubber to another placed in contact with it. The problem involved in the colouring of rubber is essentially different from the dyeing of textile fibres, because the material varies to a large extent and, moreover, the added ingredients have an effect on the colour. Sometimes rubber is cured at high temperatures at which certain dyes are destroyed altogether. At other times the cure is carried out by the use of sulphur chloride in the cold, and only those dyes which are not affected by this substance may be used in such cases.

There are important advantages in the use of organic colours for rubber, one of the most important being the brightness obtainable. Brilliant-coloured effects are now possible in sheet rubber for covering floors and also for tiles, and many interesting marble effects have been developed. The great increase in the use of rubber for decorative purposes is entirely due to the brilliance and permanency of the recently introduced organic dyes. In addition to the brightness factor, the colouring value of the organic dyes is much greater than that of the inorganic colours.

The provision of organic colours for rubber has been one of the notable achievements of the British Dyestuffs Corporation, to whose enterprise the adequate range of colours now at the disposal of the rubber trade is largely due. A booklet recently issued, the fourth of a series on rubber products, by the British Dyestuffs Corporation, gives full details of the dyes for rubber, together with useful notes concerning their selection and application.

Testing of Calcium Carbide

Comparison of British and Other Methods

AT a meeting of the British Acetylene and Welding Association in London on Thursday, February 10, Mr. Arthur Stephenson read a paper on methods of testing calcium carbide according to the regulations and standards of the British Acetylene and Welding Association and other bodies. In this it was pointed out that when the Association was formed in 1901, one of its earliest efforts was to formulate regulations regarding the sale and purchase of calcium carbide. As such regulations were substantially in agreement with regulations prescribed in other countries at the same time, they could be regarded as representing what was virtually a uniform international standard. Conditions in this respect, however, had of late undergone some change, for to-day the international standard existed in name only and not in fact, whereas formerly it existed in fact and not in name. The position at present was that the regulations of the Association differed from the so-called international standards in that they provided a higher gas yield for the consumer, without placing upon the manufacturer of calcium carbide any conditions either irksome or difficult to attain.

It must be remembered that the primary need of the user of calcium carbide was not for carbide but for acetylene gas. Therefore, it was natural that the user should demand the highest gas yield obtainable, but at the lowest price.

The number of large users of carbide was ever increasing and as acetylene was an absolute essential in many specialised industries there was a very real demand from consumers not only to know the standards upon which the commodity was sold and bought but the best means to carry out routine tests to ensure that they were obtaining value for money. The crux of the whole matter from the user's point of view was the actual cost of acetylene at the point of application, and not the cost of carbide on a gross tonnage basis. Therefore, the testing of calcium carbide was really an essential commercial function and not a matter of laboratory gymnastics.

So far as this country was concerned, practically all supplies of calcium carbide were obtained from the various factories spread over the Continent of Europe. The quality of the product was likely to vary appreciably according to the nature of the raw materials available to the factory, the economic conditions due to geographical location, the competitive nature of the market served, and the standard of the gas yield which the producer aimed at. The European manufacturer had the choice of three standard specifications to comply with or the choice of making four qualities of carbide. The British and German regulations were sufficiently alike to cause the manufacturer to produce the same quality of product, but the French regulations permitted of an appreciable reduction in the guaranteed standard of yield. It was fortunate that the British and German regulations were very similar because, although the purchaser in this country was usually very lax in regard to specifying and checking the quality of the calcium carbide he ordered, the Germans, with characteristic thoroughness, kept their central testing station in Berlin very busy and regularly employed on testing samples drawn from all parts of the country. This had indirectly helped to maintain the quality of the calcium carbide sold on the British market as well as in Germany.

Discussing the features of the British, German, and French specification, Mr. Stephenson said that the first regulation in all three cases defined the sizes of the carbide in the consignment. There were eight specified sizes in the British regulations, whereas the German did not appear to specify the sizes but gave three ranges of size. The French regulations differed materially from the others on the question of size and classification. There were three grades of calcium carbide mentioned in the French regulations, two of which carried a guarantee for gas yield. Therefore, we had in the British regulations a guaranteed gas yield for the largest range of sizes of calcium carbide, and a systematic range of sizes and a high basis for guaranteed gas yield which did not appear in either the German or French regulations.

Finally, it was pointed out that the British regulations did not provide for any special type of testing apparatus, whilst the German and French regulations defined both the method and the apparatus to be used. (As a matter of fact, a Committee of the British Acetylene and Welding Association is now considering the question of a standard apparatus.)

The Third Party Principle

To the Editor of THE CHEMICAL AGE.

SIR,—I read with much interest and no little amazement the note in THE CHEMICAL AGE of February 12 by Mr. H. T. F. Rhodes, general secretary of the B.A.C., and would suggest that both the reasoning and certain alleged instances cited are anything but correct. The plea of Mr. Rhodes, evaporated to dryness, means the "splendid isolation" of the technical worker, which I am going to suggest is entirely responsible for the present tragic economic position of research and laboratory workers in the chemical industry.

Mr. Rhodes says: "The professional worker has nothing to gain by association with manual workers." I agree most heartily if Mr. Rhodes means with any and every sort of manual worker organised in general labour unions. Has Mr. Rhodes ever considered the position of a chemist organised scientifically on strict industrial lines—*i.e.*, in an organisation such as I represent, that admits to membership every worker in the chemical industry, technician, operative and auxiliary, and no other type of worker; an organisation where the economic and psychological differences of various but associated workers are appreciated and arranged for by separating them into groups wherein they consider and formulate ideas and programmes to meet their own desires with a minimum of interference of other groups who would not understand them, but who in a larger loyalty respond to executive call to protect any and all groups within the national organisation if justice and fair play demand it.

The Drug and Chemical Workers' Industrial Union is divided into five groups, who have sufficient autonomy to administer their own affairs. Such grouping is as follows, (1) industrial chemists; (2) public service workers (chemists or dispensers); (3) retail section (chemists and druggists); (4) manufacturing section (operatives and auxiliaries); (5) foremen and clerks' section. Each section is directly represented on the governing body of the Union, the National Executive Council.

Each of these groups has a national programme of salaries and conditions drawn up and modified by each separate group from time to time. Such scale, after its adoption by the executive, becomes the Union's programme for each separate type of worker.

In the matter of industrial chemists their existing national programme commences at 10 years (either sex), 20s. per week, increasing annually to 20 years at 45s. per week; assistants at 21 years, 85s. per week, with chemists 21 years and over commencing at £300 per annum rising in 4 years to £400. Hours, 39 per week. Overtime rates, time-and-a-half, with double time Saturdays, Sundays, and Bank Holidays. Annual leave of 21 days is a scale that is now operating to the benefit of hundreds of technical workers in the chemical industry, because they believe not in the "Third Party" principle or splendid isolation, but in real intelligent unity, wherein masses of workers in a factory are united to protect the minority, as technical workers always are. In the chemical industry to-day, laboratory workers, many with degrees, are working 56 hours per week for 1s. 2½d. per hour—the same rate as applied to chemical process workers in a firm whose name is known to all.

We can show Mr. Rhodes countless instances where association with manual workers on the part of technicians has secured fair salaries and conditions, together with just treatment, that the technician alone could and will never attain.—Yours, etc.,

ARTHUR J. GILLIGAN,
General Secretary,
NATIONAL UNION OF DRUG AND CHEMICAL WORKERS.
149, Newington Causeway, London, S.E.1.

Pharmaceutical "Analysts"

To the Editor of THE CHEMICAL AGE.

SIR,—When a knight in full armour struts up fanning his peacock tail composed of a score or so letters of the alphabet, it seems a pity to stretch him on the dissecting table, and practise on him that very instructive art I acquired at St. Thomas's Hospital from that expert anatomist, Professor Parsons—dissecting. The letter of your correspondent R. F. Hunter, M.Sc., Ph.D., D.I.C., A.R.C.S., etc., is a mass of contradictions. Mere sound and fury. Davy, Liebig and Tilden were chemists, because they were professors; not professors because they were chemists; and chemists because they were fully trained pharmacists; pharmacy being the art and science of making, compounding, analysing, manufacturing, creating, mixing and preparing drugs and chemicals. It consists chiefly of chemistry aided by botany, histology, physiology, therapeutics and *materia medica*, which gave them the best possible grip and insight into the nature of substances and their properties. With energy, application and gumption they managed to become foremost members of their calling.

Your correspondent maintains that taking an engineering diploma does not make one an engineer. One would like to know what is the good of appending half the alphabet to one's name, if it denotes neither gumption nor knowledge! He argues that playing in a jazz band does not prevent one from being an efficient chemist, but selling tooth brushes does. When he talks about lab. boys, he is treading on slippery ground. He must be aware that in the Pantheon of Science the lab. boys claim a very eminent representative, Faraday; and so do the newspaper boys, Edison; but, that recent offshoot of the swank lab. boys to which your correspondent seems to belong have not sent theirs yet. Let us hope he arrives with the whole alphabet on his back, and overshadows the others by his achievements.

Again, your correspondent pleads ignorance that there is a definite qualification for pharmacists in England. If he took the trouble to visit any chemist's shop, he may see the evidence of its existence conspicuously exhibited. The customary inability to reason, as your correspondent so neatly puts it, prevents him from differentiating between shop assistants and pharmacists. The fact that pharmacists have to trade proves that their professional remuneration is not adequate; and that the public are getting services for which they do not pay in full. In Germany, where the social status of the pharmacist is higher, and his remuneration better, the community benefits by chemistry being their greatest national asset. The English chemists, against heavy odds, have not done badly; but they have to put up with an intellectually slow and pre-eminently ignorant administration, encouraged by the type of machine-made scientists whose narrowmindedness is more appalling than that of the most ignorant street sweep. One more remark: After having, in and out of season, in the lay and scientific press, criticised the past and present leaders of science, from Sir Isaac Newton, Lavoisier, William Ramsay to Sir Ernest Rutherford, Oliver Lodge, Irvine, Professor Millikan, etc., for allowing their most useful of mental faculties, common sense, to lie dormant, I am accused by your correspondent of customary inability to reason. It is highly amusing. Still, *errare humanum est*. Let us hope Mr. R. F. Hunter is mistaken for once.—Yours, etc.,

"Ashmoor," Hermon Hill, CAROL A. COFMAN-NICORESTI.
Snaresbrook, N.E.
February 14, 1927.

Explosibility of Natural Gas-air Mixtures

AT its Pittsburgh experiment station, the U.S.A. Bureau of Mines is studying the determination of the approximate lower percentages of natural gas in a mixture of natural gas and air which would be ignited and would explode when explosives were fired from a cannon into the mixture. Four series of tests were run during the past fiscal year, using an electric igniter, 3-F black blasting powder stemmed, and 40 per cent. straight nitroglycerin dynamite unstemmed to ignite the mixture. The fourth series studied the effect of turbulence on the lower limit of explosibility. During the present year it is intended to supplement the work already done so that the lower limits can be more accurately defined.

Work of the Carnegie Trust

THE report of the administration of the Carnegie Trust for the Universities of Scotland for the academic year 1925-6, submitted by the Executive Committee at a meeting held on Wednesday, February 9, of the trustees records satisfactory progress. Professor Smithells, the reviser in the physical and chemical section, states that "the year's record of work in the subjects coming under my notice appears to be excellent, and in one or two cases distinguished. There is gratifying evidence, not only of the maintenance of standards, but notably in one centre of increased scientific activity."

Chemical Matters in Parliament

Flame Throwing Apparatus

Mr. R. Morrison (House of Commons, February 14) asked the Secretary of State for War whether any units of the British Army had been trained in the use of liquid flame-throwing apparatus; and whether squads of infantry of any other European nation were equipped for liquid-flame warfare? Captain Douglas King (Financial Secretary to the War Office) replied that the answer to the first part of the question was in the negative. As regards the latter part of the question, it was not in the public interest to publish such information as was in his possession.

Poison Gas

Mr. J. Hudson (House of Commons, February 15) asked the Prime Minister whether, in view of the recommendation of the League of Nations Disarmament Commission that all subsidies, both to private and official laboratories promoting research in poison gases, be abolished, the British Government was prepared to give a lead in this matter; and whether the Government was prepared, in accordance with the further recommendation of the same Commission, to introduce legislation forbidding anyone, civilian or military, to perform exercises in the use of poisons and bacteria? Mr. Baldwin replied that until such time as a definite assurance could be obtained that all Powers were willing to adopt measures of prohibition in regard to poisons and bacteria, His Majesty's Government must take steps to be in a position to defend itself against such attacks. For this purpose research work must be continued. In regard to the second part of the question, so long as their nationals might be exposed to attacks of that nature, it was the bounden duty of His Majesty's Government to take steps to provide protection for them. In answer to further questions, he said that no one would rejoice more than he if the whole question of poison gas and so forth could be scrapped, but not all the nations of the world, and among them one or two of the largest and most important, were yet members of the League of Nations, and the work of the League was very much circumscribed, and must be, in these matters, until there was a universal League of which every nation would be a member.

Chemical Warfare Research

Replying to Mr. J. Hudson (House of Commons, February 15), Sir L. Worthington Evans, Secretary of State for War, stated that no animals had been used for experimental purposes at the chemical warfare research station at Sutton Oak.

I.C.I. and Low Temperature Carbonisation

An arrangement has been made between International Combustion, Ltd., and the new Imperial Chemical Industries, Ltd., which has a capital of approximately £56,000,000, formed by the amalgamation of Brunner, Mond, and Co., Nobel's Industries, Ltd., United Alkali Co., Ltd., and British Dyestuffs Corporation. One of the main activities of the new working arrangement between these two powerful organisations, it is understood, will be the development of low temperature carbonisation, and it is rumoured that one of the first steps will be to install a very large plant in Great Britain according to the McEwen-Runge process for the low temperature carbonisation of pulverised coal, and also for the long rotary cylindrical retort "Kohlenscheidungs-Gesellschaft" method of Germany, with which the above interests are associated.

Arsenic in Apples

"The publicity given last year should have induced American apple growers to minimise the use of arsenic spraying, but they have not done so," said Mr. R. A. Robinson, who appeared at Brentford Police Court recently on behalf of the Middlesex County Council, to prosecute John Lee, an Isleworth greengrocer, who was summoned for selling apples containing arsenate of lead, and fined £1 with costs. Mr. Robinson said that the amount of arsenic in this case—·05 grains per pound—was greatly in excess of the quantity there should be, and there was also lead to the amount of ·56 grains per pound. This made the fruit dangerous for human consumption, and he warned greengrocers and the public that it was necessary that all American apples should be washed and well wiped before being sold or eaten.

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries:—

28 (*Amalgamation of German Firms*).—"We should be glad if you could give us any information regarding the capital of the two German firms, Union Chemische fabrik fur Chemische Produkte, and Chemische Fabrik Milch Oranienburg, who have recently amalgamated. We should also appreciate any particulars you could supply respecting the capital of the combine which has been formed in the yeast and alcohol trade in Germany."

29 (*"Urea" and "Thiourea" Resin*).—"I should be greatly obliged if you could tell me where I could procure a small quantity of 'Urea' or 'Thiourea' resin, mentioned in The Chemical Age Dyestuffs Supplement of February 12, page 12."

Peace in Industry

Address by Sir Max Muspratt

Not only was the time ripe for employers and employed consciously or unconsciously to make up their differences, but they were, in fact, shaking hands all over the country. It augured extraordinarily well for the country's future. This was the opinion expressed by Sir Max Muspratt on Saturday, February 5, when speaking at the annual dinner of the Liverpool Shipping and Forwarding Agents' Association in the Midland Adelphi Hotel. The Lord Mayor, who was away on holiday in France, was represented by Alderman T. Dowd, the ex-Lord Mayor.

Sir Max Muspratt, speaking as the president of the Federation of British Industries, said the country had gone through an extraordinarily difficult year, but they had real grounds for optimism. The vitality of the nation had been proved to the whole world during the general strike and the protracted coal stoppage. Liverpool could, indeed, be satisfied with the way she faced the general strike, and there was not a moderate Labour man in the country who was not proud of what Liverpool did, for it was feared that this would be one of the great storm centres. The future of the country depended on the fundamental virtue of Britishers in being able to fight an issue to its close and then to drop all enmity and misunderstandings. If all were ready to profit from the lessons of the recent past, they would have good reason for optimism. One of their first requirements was to understand what was happening. Liverpool men needed to study very carefully the shifting of population and industry, and those concerned in the country's exports should see that the north-west of England did not lose its supremacy in industry. He did not see why the industrial North should do the work and enable a large population in the South of England to live at a very high standard. It was for Liverpool to see that its facilities of exports and imports and its general policy were such as to create a consuming public in the North at least equivalent to its industrial population. Their aim should be to increase the standard of living and to reduce the cost of living, and industrialists had that aim before them. That association, which played such an important part in distribution, could give the most valuable assistance. A contented and happy population was one of the greatest sources of a country's prosperity.

Steel Drums for Chemicals

There is a rapid increase in the use of steel containers for chemicals of all kinds. Millers Steel Drums, Ltd., of Moor Park, Renfrew, supply 40, 45 and 50 gallon standard steel drums for the carriage of a large range of products, including creosote, sulphuric acid, colours, oils, tar products, dyes, ammonia, acetone, and many others. The drums are of best quality steel sheet. Each drum is subjected to a pressure of 15 lb. per sq. in. before despatch, each end therefore successfully withstanding a load of almost 3 tons before it is passed. Drums can be supplied in lighter or heavier gauge material according to specification. Drums of galvanised sheet can be supplied at slightly higher cost; drums galvanised but dipped can also be supplied, but at considerably greater cost.

From Week to Week

THE BRITISH DYESTUFFS CORPORATION, LTD., of Manchester, were fined £5 at Bradford on Friday, February 11, for keeping 40 gallons of petroleum without a licence in a yard in Peel Street, Bradford.

DR. W. R. ORMANDY will deliver the Walmsley Memorial Lecture on "Chemistry and Engineering: Fuels and The Internal Combustion Engine" at the Northampton Engineering College, St. John Street, London, at 4.15 p.m. on Wednesday, February 23.

THE FEDERATION OF BRITISH INDUSTRIES has received a telegram from Rome stating that the General Fascist Confederation of Italian Industries have accepted an invitation from the F.B.I. to visit London early in April for an exchange of views on the principal economic questions of the day.

LT.-COL. HARRY RAMSDEN ARMITAGE has been appointed joint managing director of the Bradford Dyers' Association, Ltd., together with Mr. George Douglas. He is the son of the late Mr. John A. Armitage, who was first chairman of the Association, and who was well known in Bradford commercial circles.

A SUCCESSFUL CONCERT under the auspices of the Institute of Chemistry and British Association of Chemists (Birmingham and Midlands) was held last week at the Queen's Hotel, Birmingham. Mr. F. H. Alcock, F.I.C., presided, and an excellent programme of music, song and sketches, to which several chemists contributed, was provided.

THERE WAS AN outbreak of fire on Thursday, February 10, on the premises of the Aluminium Plant and Vessel Co., Ltd., chemical plant manufacturers, of Point Pleasant, Wandsworth, S.W., caused through mineral oil coming into contact with fire. About 36 gallons of mineral oil was destroyed and a large building of one floor used as a workshop and store had the contents damaged by fire, and a part of the roof destroyed.

UNIVERSITY NEWS.—The Council of the University of Manchester has accepted the resignation of Dr. Wilson Baker, assistant lecturer in chemistry, on his appointment to a demonstratorship in the University of Oxford. Mr. J. B. M. Herbert, B.Sc., has been appointed assistant lecturer in chemistry.—Professor Sir William J. Pope has been elected to the council of the School of Physical Sciences of the University of Cambridge.

RECENT WILLS INCLUDE: Sir William Augustus Tilden, of Northwood, Middlesex, at one time science master at Clifton College, later professor of chemistry and metallurgy at Mason College, Birmingham, and Emeritus Professor of the Imperial College of Science and Technology, President of the Institute of Chemistry, 1891–4, and of the Chemical Society, 1903–5 (net personalty £3,315), £6,461.—Mr. James Pursell, of Cramond Bridge, Midlothian, soap manufacturer, of Broughton Soap Works, Edinburgh, £15,454.

THE ALGERIAN GOVERNMENT announced that on April 1 the Djebel-Onk phosphate mine in the province of Constantine will be put up for auction. It is situated 80 kilometres south of Tebessa, 200 kilometres from the Gulf of Gabes and 300 kilometres from the Port of Bone. The deposit, it is reported, varies in thickness from 30 to 80 metres and is 10 kilometres wide. Experts have reported that 1,000 million tons of phosphate could be extracted, and that the deposit contains from 66 to 72 per cent. of phosphate.

BEET SUGAR NEWS.—Possibilities of the sugar beet industry in the West Country continue to occupy the close attention of farmers' organisations.—Major A. N. Braithwaite, M.P., replying to the toast of the "Houses of Parliament" at the annual dinner of the Driffield and District Chamber of Trade, suggested that a sugar beet factory should be erected in the district. It would require considerable financing, but that could be done in these days. A factory would not only give employment for the people who worked on the land but employment where the factories were situated.—Colonel Sir George L. Courthope, Bart., M.P., the Right Hon. G. H. Roberts, and Sir James Martin are among the directors of King's Lynn Beet Sugar Factory, Ltd., which has just been registered as a public company, "to enter into an agreement with the Centrale Suiker Maatschappij and with J. P. van Rossum, Dr. A. Wijnberg and Dr. J. A. Van Loen, and to carry on the business of cultivators of sugar beet and other produce, etc." The nominal capital is £450,000 in £1 shares. There are three life directors of the company, all domiciled in Holland.—Speaking at the annual dinner of the Brigg Chamber of Commerce, Sir Berkeley Sheffield, M.P. for Scunthorpe, said that Brigg would make an ideal centre for a sugar beet factory, as it had the waterway, and the land contained the lime necessary for sugar beet growing. Mr. Robinson in reply, said over 4,000 acres of beet was grown around Brigg district, and one of the adverse circumstances in growing this commodity was that the carriage to the nearest factory was 7s. 6d. to 10s. per ton. A factory built at Brigg would find employment for 400 to 500 people, and the cost of erecting it is estimated at £250,000.—The report of the committee of the British Sugar Beet Society, presented at the annual meeting, held on Thursday, February 10, records a satisfactory progress of the sugar beet industry in this country.

NEGOTIATIONS HAVE BEEN COMPLETED in connection with the development of the Derby Paper Staining Co., Ltd. Nobel Industries, Ltd., have taken control of the works, and a programme of increased production is being organised, involving an increase in the premises and additions to the staff.

DR. MURRAY BUTLER, President of Columbia University, has appointed a committee of alumni of the American Engineering schools "to study from the point of view of the practising engineers some of the present problems relative to engineering training and research and the duty and opportunity of Columbia University in regard to them."

SIR ALFRED MOND addressed the Newcastle Chamber of Commerce at luncheon on Tuesday. He afterwards received a small deputation, including Professors G. R. Clemo and H. V. A. Briscoe, of Armstrong College, on the possibilities of an extension of synthetic chemical industries at Tyneside. Sir Alfred also paid a visit to the Castner-Kellner Alkali Co.'s works at Carville, Wallsend-on-Tyne.

J. BLAKEBOROUGH AND SONS, LTD., have acquired from "Nuswift" (Bradford) the sole manufacturing and selling right of the "Nuswift" patent fire extinguishers. The services of Mr. J. A. Goodall—the patentee—have been retained, and business will, in future, be dealt with at the works of J. Blakeborough and Sons, Ltd., Brighouse, to which address all communications should be forwarded.

THE DYERS' RESEARCH MEDAL, offered each year by the Worshipful Company of Dyers for the best scientific research or technical investigation connected with the tinctorial arts, has been awarded for 1925-6 to Dr. H. H. Hodgson, for work carried out in the department of colour chemistry at the Technical College, Huddersfield. During 1926 sixteen original papers have been published by Dr. Hodgson and his research students in various scientific journals.

APPLICATIONS ARE INVITED for the following appointments:—Assistant Government Analyst in Nigeria. £600-£30-£720-£40-£920, plus free quarters. The Private Secretary (Appointments), Colonial Office, 38, Old Queen Street, London, S.W.1. March 1.—Lecturer and Demonstrator in Organic Chemistry in the University of Sydney, New South Wales. £350-£40-£700. The Agent-General for New South Wales, Australia House, Strand, London, W.C.2. February 28.

A MEETING of the Fuel Section and the Yorkshire Section of the Society of Chemical Industry will be held at the Queen's Hotel, Leeds, on Monday, February 28. Professor Arthur Smithells will preside during the afternoon session, the first part of which will be devoted to papers on the influence of atmosphere and temperature upon the scaling of steel. Scaling by air, water vapour, and carbon dioxide will be dealt with by Dr. C. B. Marson and Professor J. W. Cobb, and the prevention of scaling by hydrogen and carbon monoxide will be the subject of a paper by Dr. H. T. Angus and Professor Cobb. Later Dr. A. Parker (Research Chemist of the Joint Research Committee of the University of Leeds and the Institution of Gas Engineers) will present a thermal study of the process of manufacture of water gas, in which a new scheme for separate thermal analyses of the air blow periods is proposed. At the evening session, over which Mr. B. A. Burrell (chairman of the Yorkshire Section) will preside, Mr. R. A. Mott, of the Department of Fuel Technology in the University of Sheffield, will develop a theory of coking; Mr. H. Hollings and Mr. N. E. Siderfin, Gas Light and Coke Company, will present a paper on coke in relation to some of its industrial and domestic uses; and Miss Margaret F. Bligh and Mr. H. J. Hodson, of the Fuel Department of the University of Leeds, will give a paper on the behaviour of cokes in the open grate. An invitation will be extended to members to visit the fuel laboratories of the University of Leeds.

Obituary

DR. CHARLES DOOLITTLE WALCOTT, head of the Smithsonian Institution, one of the leading geologists of the world.

MR. RICHARD GUMMOW, aged 80, of Longstone, St. Stephens, for over half a century connected with the West of England China Clay Co., Ltd.

MAJOR O. C. JOHNSEN, a director of Johnsen and Jorgensen Flint Glass, Ltd., and British Cellofoil, Ltd. The firm of Johnsen and Jorgensen, Ltd., was founded by his father.

MR. E. A. HANCOCK, 62, principal of the Ceramic Art Colour Works at Diglis, Worcester. The works have been carried on by five successive generations of the Hancock family. Mr. Hancock's great-grandfather supplied colours to Josiah Wedgwood for his famous ware.

MR. WILLIAM HENRY STUART, head of the firm of Stuart and Sons, Ltd., flint glass manufacturers, of the Red House Glass Works, Wordsley, Stourbridge, on February 15. Mr. Stuart, who was in his seventy-eighth year, was one of the leaders of the flint glass industry in the country, and was formerly chairman of the National Flint Glass Manufacturers' Association. In recent years he was particularly active in the promotion by the trade of an application to the Government for the inclusion of the glass trade within the provisions of the Safeguarding of Industries Act.

References to Current Literature

British

DYEING AND DYESTUFFS.—Recent developments in the dyeing of celanese mixtures. C. G. Candlish. *J. Soc. Dyers and Col.*, February, pp. 37–42.

The behaviour of oxides of lead towards dyestuffs. I. A. N. Adamson and J. K. Wood. *J. Soc. Dyers and Col.*, February, pp. 47–51.

FLAMES.—The supposed law of flame speeds. W. Payman and R. V. Wheeler. *Nature*, February 12, pp. 238.

The propagation of flame in mixtures of methane and air. V. The movement of the medium in which the flame travels. W. R. Chapman and R. V. Wheeler. *Chem. Soc. Trans.*, January, pp. 38–46.

The movement of flame in closed vessels: Correlation with the development of pressure. O. C. de C. Ellis and R. V. Wheeler. *Chem. Soc. Trans.*, January, pp. 153–158.

The "uniform movement" of flame in mixtures of hydrogen and air. E. H. M. Georgeson and F. J. Hartwell. *Chem. Soc. Trans.*, January, pp. 265–267.

ORGANIC.—The chemical action of *p*-quinones on proteins and other substances. E. A. Cooper and S. D. Nicholas. *J.S.C.I.*, February 11, pp. 59–60 T.

The rearrangement of alkylamines. W. J. Hickinbottom. *Chem. Soc. Trans.*, January, pp. 64–67.

Substituted diaryl ethers. I. Di-*p*-tolyl ether. J. Reilly, P. J. Drumm, and H. S. B. Barrett. *Chem. Soc. Trans.*, January, pp. 67–73.

SUGARS.—The position of the sugar nucleus in the *Quercetin* glucosides. G. F. Attree and A. G. Perkin. *Chem. Soc. Trans.*, January, pp. 234–240.

The mechanism of the formation of citric and oxalic acids from sugars by *Aspergillus Niger*. F. Challenger, V. Subramaniam, and T. K. Walker. *Chem. Soc. Trans.*, January, pp. 200–208.

United States

ANALYSIS.—Gasometric micro-Kjeldahl estimation of nitrogen. D. D. van Slyke. *J. Biol. Chem.*, January, pp. 235–248.

CATALYSIS.—A report of attempts to activate copper for catalytic hydrogenation by oxidation and reduction. R. N. Pease and C. W. Griffin. *J. Amer. Chem. Soc.*, January, pp. 25–28.

Kinetic activity, oriented adsorption, and molecular deformation as factors in catalysis. J. Alexander. *Science*, January 21, pp. 62–63.

Catalytic oxidation of ammonia. W. W. Scott and W. D. Leech. *J. Ind. Eng. Chem.*, January, pp. 170–173.

Catalytic oxidation by means of complex iron salts. O. Baudisch and D. Davidson. *J. Biol. Chem.*, January, pp. 501–508.

GENERAL.—The breakdown of atoms at high pressures. P. W. Bridgman. *Phys. Rev.*, 1927, vol. 29, part I, pp. 188–191.

Solubilities of rare earth salts. II. C. James, H. C. Fogg, B. W. McIntire, R. H. Evans, and J. E. Donovan. *J. Amer. Chem. Soc.*, January, pp. 132–135.

Elimination and recovery of phenols from crude ammonia liquor. R. M. Crawford. *J. Ind. Eng. Chem.*, January, pp. 168–169.

Mercury and ammonia vapour an explosion hazard. C. Van Brunt. *Science*, January 21, pp. 63–64.

The influence of centrifugal force on rate of evaporation. E. Mack, Jnr. *J. Amer. Chem. Soc.*, January, pp. 135–142.

INSULIN.—The dissolution of insulin into two new active substances. C. Funk. *Science*, January 14, pp. 39–40.

ORGANIC.—The reducing action of a mixture of magnesium iodide (or bromide) and magnesium on aromatic ketones. Probable formation of magnesium subiodide (or subbromide). M. Gomberg and W. E. Bachmann. *J. Amer. Chem. Soc.*, January, pp. 236–257.

Note on the action of ammonia on propylene oxide. P. A. Levene and A. Walti. *J. Biol. Chem.*, January, pp. 461–464.

The sulphonation of *o*-toluidine and the preparation of sodium 6-chloro-5-nitrometatoluidinesulphonate. *J. Amer. Chem. Soc.*, January, pp. 298–302.

A renewed study of the sulphonation of cinnamic acid: A new proof that the secondary product is *m*-sulphocinnamic acid: Synthesis of the true *o*-sulphocinnamic acid, and the action of sodium bisulphite upon cinnamic acid derivatives. F. J. Moore and G. R. Tucker. *J. Amer. Chem. Soc.*, January, pp. 258–266.

STEROLS.—Properties of cholesterol obtained from different sources. R. J. Anderson. *J. Biol. Chem.*, January, pp. 407–418.

The distribution of dihydrositosterol in plant fats. R. J. Anderson, F. P. Nabenhauer, and R. L. Shriner. *J. Biol. Chem.*, January, pp. 389–400.

German

ALKALOIDS.—A synthesis of papaverine and related compounds. C. Mannich and O. Walther. *Arch. Pharm.*, January 11, pp. 1–11.

CELLULOSE.—The X-ray spectrum of the so-called Gladstone's alkali-cellulose compound (in connection with changes in the X-ray spectrogram of cellulose on soaking in concentrated alkali hydroxide solution). J. R. Katz. *Z. phys. Chem.*, December 30, 1926, pp. 352–359.

GENERAL.—The action of chemically active rays on gelatin. H. Brintzinger and K. Maurer. *Kolloid-Zeit.*, January, pp. 46–50.

Permanently coloured permanganate-containing barium sulphate crystals obtained by dialysis. W. Geilmann and E. Wünnenberg. *Z. anorg. u. allg. Chem.*, January 10, pp. 271–272.

A contribution to the hydrate problem. V. The electrolytic transport of water in 1*N*-solutions. H. Remy. *Z. phys. Chem.*, December 30, 1926, pp. 394–405.

The reactions of nitrosyl chloride. III. Action of nitrosyl chloride on aliphatic aldoximes. H. Rheinboldt and M. Dewald. *Annalen*, January 13, pp. 273–281.

INDICATORS.—The influence of hydrophile colloids on the colour change of indicators. A. Gutbier and A. Brintzinger. *Kolloid-Zeit.*, January, pp. 1–6.

INORGANIC.—Hydrofluoboric acid and its salts. E. Wilke-Dörfurt and G. Balz. *Z. anorg. u. allg. Chem.*, January 10, pp. 197–225.

ORGANIC.—The condensation of benzaldehyde under the action of mixed organo-magnesium compounds. A. P. Terentiew. *Z. anorg. u. allg. Chem.*, January 10, pp. 226–230.

Preparation of phenolphthalein. W. Herzog. *Chem.-Zeit.*, February 2, p. 84.

Some derivatives of phthalamic acid and of phthalimide. C. Mannich and O. Walther. *Arch. Pharm.*, January, pp. 11–15.

Some phenol bases derived from 1-phenyl-3-aminobutane. F. Mannich and K. W. Merz. *Arch. Pharm.*, January, pp. 15–26.

PHOTOCHEMISTRY.—Contribution to the kinetics of the photochemical formation of hydrogen chloride. N. Thon. *Z. phys. Chem.*, December 30, 1926, pp. 327–351.

RADICALS.—The appearance of free radicals in chemical reactions. H. Wieland, A. Hintermaier, and I. Dennstedt. *Annalen*, January 26, pp. 1–34.

STEREOCHEMISTRY.—The space lattice of *i*-erythrite. N. Schönfeldt, K. Herrmann and O. Hassel. *Z. phys. Chem.*, December 30, 1926, pp. 305–317.

Organic molecular compounds with co-ordination centres. 1. H. Rheinboldt. *Annalen*, January 13, pp. 256–273.

Miscellaneous

ANALYSIS.—The determination of glycerophosphates by the method of Copaux. P. Fleury and Z. Sutu. *J. Pharm. Chim.*, January 16, pp. 56–62.

GENERAL.—The thermal decomposition of ozone in the presence of chlorine. A. Pinkus and A. Radbill. *Bull. Soc. Chim. Belg.*, December, 1926, pp. 426–450.

The citrates of bismuth. M. Picon. *J. Pharm. Chim.*, January 16, pp. 62–69.

RICE PROTEINS.—Chemical studies on the specificity of proteins in different varieties of rice. T. Tadakoro. *Proc. Jap. Imp. Acad.*, November, pp. 498–501.

SULPHURIC ACID.—The evolution of the manufacture of sulphuric acid by the lead chamber method in recent years. De Jussieu. *L'Ind. Chem.*, January, pp. 2–10.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

264,223. LITHOPONE, MANUFACTURE OF. W. Carpmael, London. From Farbenfabriken vorm. F. Bayer and Co., Leverkusen, near Cologne, Germany. Application date, October 13, 1925.

The object is to avoid the darkening on exposure to light of lithopone or zinc sulphide obtained when zinc liquors are precipitated with sodium sulphide. This is effected by adding an alkali phosphate or silicate or an alkaline earth phosphate or silicate to the purified zinc liquors before precipitation with barium or sodium sulphide. The liquor should contain little or no chlorine. Thus, the zinc solution is mixed with sufficient sodium silicate solution to yield 2 to 5 grams of SiO_2 per kg. of lithopone, and barium sulphide or sodium sulphide then added and the resulting precipitate purified in the usual manner. Alternatively, calcium phosphate may be added so as to yield about 3 grams of P_2O_5 per kg. of lithopone.

264,237. CHEMICAL ANALYSIS OF LIQUIDS, MEANS FOR EFFECTING. H. S. Hatfield, 35, Maple Street, London, W.1. Application date, October 14, 1925.

This apparatus is for recording the completion of a reaction or the reaching of a critical stage, after which the apparatus is automatically reset. The reagent employed is standard soap

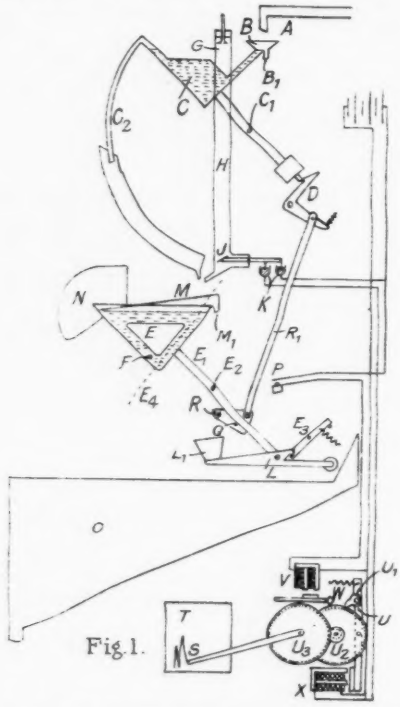


Fig. 1.

solution, which is decomposed by acids and metal salts, forming insoluble fatty acids or metal soaps. If the soap solution is in excess and the liquid is agitated by blowing in air, a froth is formed and by its overflow from the reaction vessel the recording apparatus may be set in motion. The apparatus may be used for determining the hardness of water or for analysing an alkaline liquid. In the latter case, the liquid is over-neutralised, and the excess of acid then determined by means of the soap solution. The recording apparatus may also operate through suitable relay and control devices to regulate automatically the addition of softening chemicals to water.

The liquid to be analysed, *e.g.*, water, is admitted through a pipe A, Fig. 1, to a cup B of a measuring vessel C on a lever pivoted at C_1 and held by a catch D. When the catch is released, the vessel C is tilted and the liquid discharged through pipe C_2 into the reaction vessel E. The reagent soap solution falls drop by drop from a pipe G through a glass tube H on to a vane J, and thence to the vessel E. The mixture is agitated by

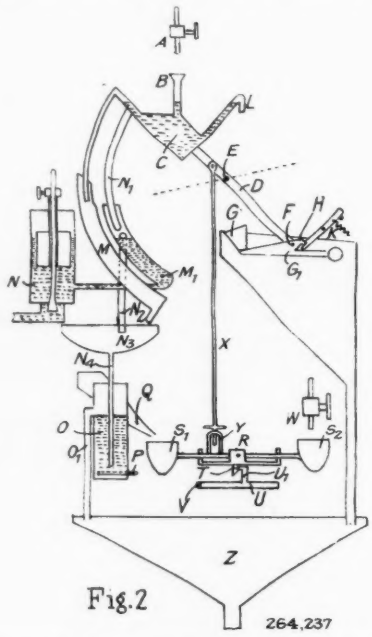


Fig. 2

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air blown through an opening F, so that on the soap reaching a slight excess a froth is formed, and some liquid is expelled through the opening M_1 to the cup L_1. The lever L is thus unbalanced, and the catch E_3 released so that the lever E_1 is tilted and the vessel E is discharged into the hood N. The tilting of the lever E_1 strikes and closes an electric contact P, so that a magnet V is energised, and a pawl W lifted, thus allowing the recording pen S to drop to zero. On the return of the empty vessel E to its normal position, the arm E_1 strikes a pin Q on a plate pivoted at R so that the link R_1 and catch D are operated to release the measuring vessel C so that a fresh charge is delivered to the reaction vessel E. The result of each analysis is automatically recorded by a counting apparatus operated by the drops of reagent striking the plate J and opening the mercury contacts K. This de-energises an electro-magnet X, and a ratchet U is operated to rotate the toothed wheels U_2, U_3. The fall of each drop of reagent is thus recorded by a drum T.

A modified form of apparatus is described in which the liquid and reagent are simultaneously admitted to the reaction vessel. The liquid, *e.g.*, water, to be tested is admitted through a pipe A, Fig. 2, to the measuring vessel C. The overflow passes through an opening L to a cup G on a lever G_1, which is maintained by a catch K. The vessel C is carried on a lever D pivoted at E and connected to the lever G_1 at F. The overflow thus releases the catch and allows the vessel C to tilt and discharge its contents through a pipe M to a funnel N_3, and thence to the reaction vessel O. A curved arm N_1 simultaneously displaces a fixed quantity of reagent from a tube M_1 through a pipe N_2 to the funnel N_3. The liquid in M_1 is replenished from a reservoir N having a float-operated valve. Each charge of water and reagent displaces the previous charge from the vessel O through the overflow O_1. If the soap solution is in excess and froth is formed, some of it overflows through the pipe Q to a cup S_1 on a balanced lever R carrying a second

cup S_2 into which water is allowed to drip from the valve W. If there is insufficient overflow of froth to balance the water in the cup S_2 the arm R will tilt and release the catch U_1, thus allowing the lever U to fall and actuate an indicator or alarm to show that the water, if such is being tested, is above a certain standard of hardness. The tilting of the rod E operates a rod X to tilt the arm R and empty the cups S_1, S_2. When testing reactions in which the production of froth is not possible, the tube F, Fig. 1, may be supplied with air or gas at constant pressure so that the pressure at the point at which it enters the liquid varies with the surface tension of the liquid. This variation of pressure may be employed to operate the catch E_3. Other methods may be employed for determining the end point of the reaction, *e.g.*, the use of a hydrogen electrode in the titration of acids and alkalies. The change of electric resistance may be employed in cases where precipitation occurs, and the decomposition voltage may be employed in cases where a metal is removed by precipitation or a depolariser such as chlorine is destroyed by a reagent.

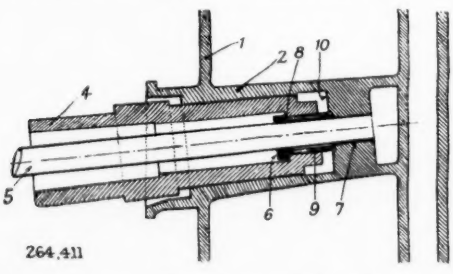
In other cases in which coloured indicators such as phenolphthalein, methyl orange, litmus, or permanganate are used, the colour of a beam of light sent through the vessel E is affected, and if received on a photo-electric cell will cause variations of voltage which may be used to operate a relay controlling the catch E_3.

264,261. Carbohydrate Compounds, Production of. W. Harrison, Stockport Road, Longsight, Manchester. Application date, October 24, 1925.

It is known that when carbohydrate xanthogenates, such as cellulose xanthogenate (viscose) or starch xanthogenate are treated with iodine solution in the presence of a weak acid, potassium ferri-cyanide, sodium ferri-cyanide, or copper salts, a precipitation takes place. These oxidising agents are costly, and other oxidising agents such as sodium hypochlorite, hydrogen peroxide or potassium permanganate split off the carbohydrate component. In this invention, the above xanthogenates are treated with nitrogen trioxide or the corresponding acid or nitrogen tetroxide in the presence of weak acids. It is found that nitrous acid, although usually a reducing agent, acts in this case in a manner similar to iodine. Strong mineral acids must not be present and the solution should not be of sufficient acidity to cause the separation of the carbon disulphide group from the carbohydrate derivative. A weak acid such as acetic acid may be used. The product separates as a porous or spongy precipitate which has a high activity. The product after washing may be soaked in a solution of sodium sulphide, sodium sulphite or bisulphite, washed, and dissolved in caustic soda solution. Alternatively, the spongy product can be treated with caustic soda solution containing sodium sulphide or sulphite, yielding a solution which can be coagulated with acids and is suitable for the manufacture of films or filling agents. The process can be applied to the treatment of fibres, fabrics, or threads of cellulose, either partly or wholly converted into xanthogenate, while still retaining their form.

264,411. Pyrites and Other Furnaces. E. Bracq, Achicourt les Arras, Pas de Calais, France. International Convention date, April 7, 1926.

The object of this invention is to enable the rabble arms of pyrites furnaces to be quickly dismantled even if tightly



fixed in their sockets. The central spindle 1 is provided with conical sockets 2 with which the ends of the rabble arms 4 engage. A tube 5 having a shoulder 6 and a threaded extremity 7 screws into a corresponding hole in the socket 2, so that the shoulder 6 bears against the end 8 of the conical sleeve 4. A ring 9 is threaded externally with a left hand screw thread, and is hexagonal internally. When replacing the arm 4 the tube 5 is first unscrewed and withdrawn, and a steel bar of hexagonal section is then introduced into the ring 9 so that it may be screwed inwardly and thus force the arm 4 out of its socket 2.

Note.—Abstracts of the following specifications which are now accepted, appeared in The Chemical Age when they became open to inspection under the International Convention: 253,128 (Distilleries des Deux-Sevres), relating to simultaneous dehydration and purifying of alcohol, see Vol. XV, p. 186; 256,634 (F. Krupp Grusonwerk Akt.-Ges.), relating to treatment of tin-containing ores and metallurgical products, see Vol. XV, p. 39 (Metallurgical Section).

International Specifications not yet Accepted

262,475. Catalytic Agents. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, December 7, 1925.

Volatile catalysts are adsorbed from the reaction gases by means of active carbon, pumice, or silica. The adsorbent may be mixed with the catalyst, or it may be placed on both sides of the catalyst and the gas stream reversed periodically. The catalyst deposited in the porous adsorbent is very active. In an example, a mixture of phosphorus and water vapours is passed through metallic copper and then through porous pumice. The catalyst adsorbed in the pumice is more active than that obtained by impregnating pumice with a copper salt and igniting. The method may be applied to prevent loss of cuprous chloride in the Deacon chlorine process.

262,738. Asphalt; Purifying Oils. Deutschen Bergin Akt.-Ges., für Kohle- und Erdolchemie, Heidelberg, Germany. International Convention date, December 11, 1925.

Water is removed from the products of the destructive hydrogenation of coal, and the bituminous materials containing asphalt are then mixed with aliphatic hydrocarbons such as gas oil. The unaltered coal and its impurities and then the asphalt settle out. In an example, the products of hydrogenation are freed from water and other substances distilling up to 280° C., and the residue mixed with 20 per cent. of raw petroleum. The liquid is decanted from asphalt and other solids after one hour, and then from pure soft asphalt after three to five hours more. The oil is then fractionally distilled to obtain light lubricating oils and gas oils.

262,774. Dyes. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, December 8, 1925.

Violanthrone is chlorinated in nitrobenzene at a temperature above 80° C., so as to introduce at least three atoms of chlorine into the molecule. Sulphur chlorides may be used as well as chlorine. Blue dyeings fast to water are obtained.

262,802. Cyanides. Naamlooze Vennootschap Nederlandsche Mijnbouw En Handelmaatschappij, 410, Heerengracht, Amsterdam. International Convention date, December 10, 1925.

Alkali or barium humates, or humic acid, with or without sawdust or other carbonaceous material, are coked in presence of alkali or alkaline earth compounds, with or without a catalyst. The product is treated with nitrogen to obtain cyanides. The humic acid may be derived from brown coal humus by treating with alkali carbonate and evaporating the extract.

262,819. Dyes. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, December 14, 1925.

Bz1 : Bz1^1—dibenzanthronyls are treated with alkaline condensing or reducing agents, yielding products which differ in shade from those obtained by alkaline condensat on of halogen benzanthrones or halogen 2 : 2^1-dibenzanthronyls. The Bz1 : Bz1^1-dibenzanthronyls are obtained by treating Bz1-halogen-benzanthrones with metal powders, or by boiling Bz1-diazo-benzanthrones with cuprous chloride, or by oxidising benzanthrones in acid solution. Examples are given of the treatment of Bz1 : Bz1^1-dibenzanthronyl, Bz2 : Bz2^1-dimethyl-Bz1 : Bz1^1-dibenzanthronyl, and 6 : 6^1-dichlor-Bz1-Bz1^1-dibenzanthronyl by the above process. The products give blue and red-violet shades on cotton.

D

263,082. Cracking and Hydrogenating Organic Compounds. D. Florentin, 2, Quai du Marché Neuf, Paris, A. Kling, 6, Villa George Sand, Paris, and C. Matignon, 7, Boulevard Carnot, Bourg-la-Reine, Seine, France. International Convention date, December 17, 1925.

Organic compounds containing hydroxyl, carboxyl, and like oxygenated groups are treated with hydrogen, with or without carbon monoxide or hydrocarbon gas at 350°–480° C. and a pressure of at least 45 kg. per sq. cm. in presence of dehydrating catalysts producing internal reactions reducing the stability of the compounds and their effective temperature of hydrogenation. Phenol, cresols, phenolic oils, cyclohexanol derivatives, shale oils, vegetable and animal oils may be thus treated, employing thoria, alumina, clay, or silica as catalysts. An example is given, showing the production from shale oil of 80 per cent. of an oil of specific gravity 0·855, 48 per cent. of which distils below 205° C. and is practically saturated.

263,117. Sulphonating Fats, Oils, and their Acids. H. T. Böhme Akt.-Ges., 29, Moritzstrasse, Chemnitz, Germany. International Convention date, December 16, 1925. Addition to 261,385.

According to specification 261,385 (see The Chemical Age, Vol. XVI, p. 91), fats, oils, and their acids are sulphonated in the presence of organic acid anhydrides or chlorides. In this invention, the proportion of anhydride or chloride is increased so that there is more than one molecular part to each molecular part of oil, and more sulphuric acid is combined. Probably the hydrogen in methylene groups is replaced by sulphonic groups. The products are employed for textile and other purposes, as dispersion agents for dissolving water-insoluble substances, or converting them into emulsions, or as penetrating agents for felt or leather. It is also employed as a wetting agent, as an addition to mercerisation liquors, for fat-splitting at low temperatures, and as a cleansing agent.

263,119 and 263,120. Lithopone. New Jersey Zinc Co., 160, Front Street, Manhattan, New York. (Assignees of W. C. Hooey, Palmerton, Pa., U.S.A.) International Convention date, December 15, 1925.

263,119. The end point of the reaction between zinc sulphate and barium sulphide is determined by the amount of hydrate and or sulphydrate present in the crude pulp. The ratio of hydrate to sulphydrate radicals in the barium sulphide liquor is controlled by adding barium hydrate or sulphuric acid. The hydrate content can be increased by producing the barium sulphide from barytes of high iron or manganese content, by using moist material in the baryte furnace, or by using the later leaches of the furnace product. The results depend on the excess of and ratio between the hydrate and sulphydrate radicals in the crude pulp.

263,120. The physical properties of lithopone, *e.g.*, oil absorption, alkalinity, covering power, light resistance, etc., are controlled by establishing the ratio between and or excess of the hydrate and sulphydrate radicals in the crude pulp at the end of the reaction. These factors are controlled as described in 263,119 above.

Latest Notifications.

265,540. Manufacture of moulded sulphur. Rhenania Verein Chemischer Fabriken Akt.-Ges. February 3, 1926.

265,545. Process of preparing nitro amino benzoyl *o*-benzoic acid and its derivatives. Newport Co. February 8, 1926.

265,550. Manufacture of lithopone. New Jersey Zinc Co. February 2, 1926.

265,553. Tetrakisazo dyes, and the process of manufacture. Newport Co. February 6, 1926.

265,600. Manufacture of a new preparation which emits β-rays. Wreschner, Dr. M., and Loeb, Dr. L. F. February 8, 1926.

265,601. Process for the manufacture of condensation products from naphthalene or naphthalene derivatives and ethylene. I. G. Farbenindustrie Akt.-Ges. February 4, 1926.

265,624. Catalytic oxidation of carbon monoxide. I. G. Farbenindustrie Akt.-Ges. February 8, 1926.

Specifications Accepted with Date of Application

242,306. Dyestuffs, Process for manufacturing. A. Zinke. November 3, 1924.

250,581. Zinc sulphide pigment. L. Mellersh-Jackson. (*New Jersey Zinc Co.*) April 6, 1926.

252,394. Resinous condensation products, and methods of preparation. British Thomson-Houston Co., Ltd. May 23, 1925.

253,489. Petroleum and similar hydrocarbons, Distillation of De Pataafsche Petroleum Maatschappij. June 13, 1925.

264,937. Cellulose derivatives, Manufacture of. H. Dreyfus. October 30, 1925.

264,953. Deposition of boron in coherent form. W. J. Tennant. (*Naamlooze Vennootschap Philips' Gloeilampenfabrieken.*) November 9, 1925.

264,955. Emulsification. J. T. Jones. November 10, 1925.

265,032. Colour lakes, Manufacture and production of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) March 29, 1926.

265,033. Condensation products from phenols and formaldehyde, Manufacture of. E. J. P. C. de Jarny. March 30, 1926.

265,036. Zinc and zinc compounds, Recovery of. E. C. R. Marks. (*American Smelting and Refining Co.*) April 7, 1926.

265,046. Distillation of carbonaceous materials, Apparatus for. B. McCormick. May 7, 1926.

264,558. Acetic acid, Manufacture of. H. Dreyfus. June 13, 1925.

264,569. Extraction of lead from materials containing it or its compounds. S. C. Smith. July 21, 1925.

249,800. Lead compounds, Manufacture of. Commonwealth White Lead and Paints Proprietary, Ltd. March 30, 1925.

Applications for Patents

Baddiley, J., British Dyestuffs Corporation, Ltd., Dootson, P., Shepherdson, A., and Thornley, S. Manufacture of dyestuffs. 3,609. February 8.

Bentley, W. H., Blythe and Son, Ltd., and Catlow, B. Purification of sulphur. 3,946. February 12.

British Drug Houses, Ltd., and Carr, F. H. Manufacture of oils containing vitamins. 3,440. February 7.

British Dyestuffs Corporation, Ltd., Saunders, K. H., and Wignall, H. Manufacture of ethylene glycol. 3,610. February 8.

British Dyestuffs Corporation, Ltd., Bunbury, H. M., Evans, H., and Shepherdson, A. Manufacture of vat dyestuffs. 3,713. February 9.

British Dyestuffs Corporation, Ltd., and Hollins, C. Manufacture of wool, fur, etc. 3,714. February 9.

Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Manufacture of non-thickening pastes and lacquers. 3,473. February 7.

Carpmael, W., and I. G. Farbenindustrie Akt.-Ges. Manufacture of cellulose esters, etc. 3,595. February 8.

Chemische Fabrik auf actien, vorm. E. Schering. Process for preventing loss of carbohydrates in plants when stored. 3,702. February 9. (Germany, February 26, 1926.)

Dreyfus, H. Manufacture of aliphatic compounds. 3,551. February 8.

Dreyfus, H. Treatment of materials containing cellulose derivatives. 3,653. February 9.

Engelke, E. F., Komlos, A., and Komlos, J. Manufacture of compounds of carbon and sulphur, etc. 3,928. February 11. (Germany, February 15, 1926.)

Geigy Akt.-Ges., J. R. Manufacture of acid dyestuffs. 3,890. February 11. (Germany, February 13, 1926.)

Hall, A. J., and Silver Springs Bleaching and Dyeing Co., Ltd. Rendering cellulose acetate yarn, etc., resistant to deterioration. 3,499. February 8.

Hall, A. J., and Silver Springs Bleaching and Dyeing Co., Ltd. Preparing cellulose acetate filaments. 3,961. February 12.

I. G. Farbenindustrie Akt.-Ges. Catalytic oxidation of carbon monoxide. 3,429. February 7. (Germany, February 8, 1926.)

I. G. Farbenindustrie Akt.-Ges. Production of primary aliphatic, etc., amines. 3,430. February 7. (Germany, February 9, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs. 3,559. February 8. (Germany, February 9, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of tanning agents. 3,802. February 10. (Germany, February 23, 1926.)

I. G. Farbenindustrie Akt.-Ges. Decomposition of hydrocarbons. 3,903. February 11. (Germany, February 11, 1926.)

I. G. Farbenindustrie Akt.-Ges. Manufacture of solid diazo salts. 3,889. February 11. (Germany, February 12, 1926.)

Leemans, J. P. Manufacture of sulphuric acid. 3,907, 3,908. February 11.

Massie, D. M. Colouring of magnesium oxychloride cements. 3,734. February 10.

Merck, E. (firm of). Process for dehydrating ethyl alcohol. 3,721. February 9. (Germany, October 30, 1926.)

Naamlooze Vennootschap Silica en Ovenbouw Maatschappij. Recovery of benzenes from coal gas. 3,887. February 11. (Germany, February 12, 1926.)

New Jersey Zinc Co. Manufacture of zinc oxide. 4,002. February 12. (United States, March 27, 1926.)

Olpin, H. C. Treatment of materials containing cellulose derivatives. 3,652. February 9.

Riedel Akt.-Ges., J. D. Process for producing adipic acid. 3,427. February 7. (Germany, February 12, 1926.)

Soc. des Brevets Etrangers Lefranc et Cie. Extraction of butyric acid, etc. 3,918. February 11. (France, August 27, 1926.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £34 per ton; powder, £36 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° TW.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations: 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, packages extra, returnable.

BLEACHING POWDER.—Spot, £9 10s per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags, carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 12s. 6d. to £5 17s. 6d. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 2s. 5d. to 2s. 10d. per gall.; pyridinised industrial, 2s. 7d. to 3s. per gall.; mineralised, 3s. 6d. to 3s. 10d. per gall.; 64 O.P., 1d. extra in all cases; prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3¾d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 per ton for home market, 1-cwt. iron drums included.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.r. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. per lb. Crude 60's, 1s. 8½d. to 1s. 9½d. per gall.

ACID CRESYLIC 99/100.—2s. 3d. to 2s. 4½d. per gall. Steady. 97/99.—2s. to 2s. 1d. per gall. Pale, 95%, 1s. 10d. to 2s. per gall. Dark, 1s. 9d. to 1s. 10d. per gall.

ANTHRACENE.—A quality, 2½d. to 3d. per unit. 40%, 3d. per unit.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7½d. to 8d. per gall.; both according to gravity.

BENZOLE.—Crude 65's, 1s. 3d. to 1s. 4d. per gall., ex works in tank wagons. Standard Motor, 1s. 11d. to 2s. 4d. per gall., ex works in tank wagons. Pure, 2s. 2d. to 2s. 5d. per gall., ex works in tank wagons.

TOLUOLE.—90%, 1s. 11½d. to 2s. 3d. per gall. Firm. Pure, 2s. 2½d. to 2s. 6d. per gall.

XYLOL.—2s. 3d. to 2s. 6d. per gall. Pure, 4s. per gall.

CREOSOTE.—Cresylic, 20/24%, 10½d. per gall. Standard specification, 6¾d. to 9d.; middle oil, 7½d. to 8d. per gall. Heavy, 8½d. to 9d. per gall.

NAPHTHA.—Crude, 9½d. to 1s. 0½d. per gall. according to quality. Solvent 90/160, 2s. to 2s. 1d. per gall. Solvent 95/160, 1s. 9d. to 1s. 10d. per gall. Solvent 90/190, 1s. 3½d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £8 per ton. Whizzed or hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £11 10s. to £12 10s. per ton. Quiet. Flaked, £12 10s. per ton, according to districts.

PITCH.—Medium soft, 10?s. 6d. to 12?s. per ton, according to district.

PYRIDINE.—90/140, 9s. 6d. to 13s. per gall. Nominal. 90/180, 7s. 6d. per gall. Heavy, 5s. to 8s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100%.

ACID BENZOIC.—1s. 9d. per lb.

ACID GAMMA.—8s. per lb.

ACID H.—3s. 3d. per lb. 100% basis d/d.

ACID NAPHTHIONIC.—1s. 6d. per lb. 100% basis d/d.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb. 100% basis d/d.

ACID SULPHANILIC.—9d. per lb. 100% basis d/d.

ANILINE OIL.—7d. per lb. naked at works.

ANILINE SALTS.—7d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—4d. to 4½d. per lb.

m-CRESOL 98/100%.—2s. 8¾d. per lb.

p-CRESOL 32/34° C.—2s. 8¾d. per lb.

DICHLORANILINE.—2s. 3d. per lb.

DIMETHYLANILINE.—2s. per lb. d/d. Drums extra.

DINITROBENZENE.—9d. per lb. naked at works.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—11d. to 1s. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb. d/d.

B-NAPHTHYLAMINE.—3s. per lb. d/d.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 9d. per lb. d/d.

NITROBENZENE.—7d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb. d/d.

R. SALT.—2s. 4d. per lb. 100% basis d/d.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—7½d. per lb. naked at works.

p-TOLUIDINE.—2s. 2d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 11d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £9 per ton. Scarce. Grey, £17 5s. per ton. Liquor, 9d. per gall. 32° Tw.

CHARCOAL.—£8 5s. to £10 per ton and upwards, according to grade and locality.

IRON LIQUOR.—1s. 6d. per gall. 32° Tw. 1s. 2d. per gall. 24° Tw.

RED LIQUOR.—10d. to 11d. per gall. 16° Tw.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 10d. to 4s. per gall., 60% O.P. Solvent, 4s. per gall., 40% O.P.

WOOD TAR.—£4 to £5 per ton and upwards, according to grade.

BROWN SUGAR OF LEAD.—£41 to £42 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 5½d. per lb., according to quality, Crimson, 1s. 3d. to 1s. 7½d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—2s. per lb.

BARYTES.—£3 10s. to £6 15s. per ton, according to quality.

CADMIUM SULPHIDE.—2s. 9d. per lb.

CARBON BISULPHIDE.—£20 to £25 per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£46 to £55 per ton, according to quantity, drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5¾d. to 6¾d. per lb

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£47 10s. to £50 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb. carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—5s. 3d. per lb.

ZINC SULPHIDE.—1s. 1d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4d. to 2s. 5d. per lb.

ACID, BENZOIC B.P.—2s. to 2s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. per oz.; 500 oz. lots, 1s. per oz.

ACID, BORIC B.P.—Crystal, £41 per ton; powder, £45 per ton. Carriage paid any station in Great Britain, in ton lots.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.—1s. 3½d. per lb., less 5%.

ACID, GALLIC.—2s. 8d. per lb. for pure crystal, in cwt. lots.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. Resublimed, 8s. 3d. per lb.

ACID, SALICYLIC, B.P.—1s. 4d. to 1s. 5d. per lb. Technical.—11½d. to 1s. per lb.

ACID, TANNIC B.P.—2s. 9d. to 2s. 11d. per lb.

ACID, TARTARIC.—1s. 0½d. per lb., less 5%.

AMIDOL.—9s. 6d. per lb., d/d.

ACETANILIDE.—1s. 7d. to 1s. 8d. per lb. for quantities.

AMIDOPYRIN.—11s. 6d. per lb.

AMMONIUM BENZOATE.—3s. 3d. to 3s. 6d. per lb., according to quantity.

AMMONIUM CARBONATE B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated: lump, 1s. per lb.; powder, 1s. 3d. per lb.

ASPIRIN.—2s. 4d. per lb. Good demand.

ATROPINE SULPHATE.—11s. per oz. for English make.

BARBITONE.—8s. 9d. per lb.

BENZONAPHTHOL.—3s. 3d. per lb. spot.

BISMUTH CARBONATE.—12s. 3d. to 14s. 3d. per lb.

BISMUTH CITRATE.—9s. 3d. to 11s. 3d. per lb.

BISMUTH SALICYLATE.—10s. to 12s. per lb.

BISMUTH SUBNITRATE.—10s. 6d. to 12s. 6d. per lb., all above bismuth salts, according to quantity.

BISMUTH NITRATE.—6s. 9d. per lb.

BISMUTH OXIDE.—13s. 9d. per lb.

BISMUTH SUBCHLORIDE.—11s. 9d. per lb.

BISMUTH SUBGALLATE.—9s. 9d. per lb.

BORAX B.P.—Crystal, £24 per ton; powder, £25 per ton. Carriage paid any station in Great Britain, in ton lots.

BROMIDES.—Potassium, 1s. 11d. to 2s. per lb.; sodium, 2s. 2d. to 2s. 3d. per lb.; ammonium, 2s. 4d. to 2s. 5d. per lb., all spot. Market firmer.

CALCIUM LACTATE.—1s. 4d. to 1s. 5d.

CHLORAL HYDRATE.—3s. 3d. to 3s. 6d. per lb., duty paid.

CHLOROFORM.—2s. 3d. to 2s. 7½d. per lb., according to quantity.

CREOSOTE CARBONATE.—6s. per lb.

ETHER METH.—1s. 1d. to 1s. 11½d. per lb., according to sp. gr. and quantity. Ether purif. (Aether B.P., 1914), 2s. 3d. to 2s. 4d., according to quantity.

FORMALDEHYDE.—£39 per ton, in barrels ex wharf.

GUAIACOL CARBONATE.—6s. 6d. to 7s. per lb.

HEXAMINE.—2s. 4d. to 2s. 6d. per lb.

HOMATROPINE HYDROBROMIDE.—30s. per oz.

HYDRASTINE HYDROCHLORIDE.—English make offered at 120s. per oz.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 8d. per gallon f.o.r. makers' works, naked.

HYDROQUINONE.—4s. per lb., in cwt. lots.

HYPOPHOSPHITES.—Calcium, 3s. 6d. per lb., for 28-lb. lots; potassium, 4s. 1d. per lb.; sodium, 4s. per lb.

IRON AMMONIUM CITRATE B.P.—2s. 1d. to 2s. 4d. per lb. Green, 2s. 4d. to 2s. 9d. per lb. U.S.P., 2s. 2d. to 2s. 5d. per lb.

IRON PERCHLORIDE.—22s. per cwt., 112 lb. lots.

MAGNESIUM CARBONATE.—Light Commercial, £33 per ton net.

MAGNESIUM OXIDE.—Light Commercial, £67 10s. per ton, less 2½%; Heavy Commercial, £22 per ton, less 2½%; Heavy Pure, 2s. to 2s. 3d. per lb., in 1 cwt. lots.

MENTHOL.—A.B.R. recrystallised B.P., 18s. 9d. per lb. net; Synthetic, 10s. 6d. to 12s. per lb., according to quantity; 10s. 6d. for 1 cwt. lots and upwards; Liquid (95%), 12s. per lb.; Detached Cryst., 14s. 6d. per lb.

MERCURIALS.—Red Oxide, 6s. 5d. to 6s. 7d. per lb., levig., 6s. 1d. per lb.; Corrosive Sublimate, Lump, 4s. 3d. per lb., Powder, 4s. 3d. per lb.; White Precipitate, 5s. 1d. per lb., Powder, 5s. 1d. per lb., Extra Fine, 5s. 1d. to 5s. 2d. per lb.; Calomel, 5s. 3d. to 5s. 5d. per lb.; Yellow Oxide, 5s. 10d. to 5s. 11d. per lb.; Persulph., B.P.C., 5s. 1d. to 5s. 2d. per lb.; Sulph. nig., 4s. 10d. to 4s. 11d. per lb.

METHYL SALICYLATE.—1s. 9d. per lb.

METHYL SULPHONAL.—15s. 6d. per lb.

METOL.—11s. per lb. British make.

PARAFORMALDEHYDE.—1s. 9d. per lb. for 100% powder.

PARALDEHYDE.—1s. 4d. per lb.

PHENACETIN.—3s. 9d. to 4s. per lb.

PHENAZONE.—5s. 9d. to 6s. per lb.

PHENOLPHTHALEIN.—6s. to 6s. 3d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—86s. per cwt., less 2½% for ton lots.

POTASSIUM CITRATE.—1s. 11d. to 2s. 2d. per lb.

POTASSIUM FERRICYANIDE.—1s. 9d. per lb., in cwt. lots.

POTASSIUM IODIDE.—16s. 8d. to 17s. 2d. per lb. for 1 cwt. lots.

POTASSIUM METABISULPHITE.—6d. per lb., 1-cwt. kegs included, f.o.r. London.

POTASSIUM PERMANGANATE.—B.P. crystals, 6½d. per lb., spot.

QUININE SULPHATE.—2s. per oz., 1s. 8d. to 1s. 9d. for 1000 oz. lots in 100 oz. tins.

RESORCIN.—4s. to 4s. 3d. per lb., spot.

SACCHARIN.—55s. per lb.

SALOL.—3s. to 3s. 3d. per lb.

SODIUM BENZOATE, B.P.—1s. 10d. to 2s. 2d. per lb.

SODIUM CITRATE, B.P.C., 1911.—1s. 8d. to 1s. 11d. per lb. B.P.C., 1923—2s. to 2s. 1d. per lb. for 1 cwt. lots. U.S.P., 1s. 11d. to 2s. 2d. per lb., according to quantity.

SODIUM FERROCYANIDE.—4d. per lb. carriage paid.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 5s. per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—77s. 6d. to 82s. 6d. per cwt., according to quantity.

SODIUM SALICYLATE.—Powder, 1s. 9½d. to 1s. 10½d. per lb. Crystal, 1s. 10d. to 1s. 11d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS, £27 10s. to £28 10s. per ton, according to quantity; 1-cwt. kegs included.

SULPHONAL.—10s. 6d. per lb.

TARTAR EMETIC, B.P.—Crystal or powder, 2s. to 2s. 2d. per lb.

THYMOL.—Puriss., 11s. 9d. to 13s. 9d. per lb., according to quantity. Firmer. Natural, 14s. 9d. per lb. Cheaper.

Perfumery Chemicals

ACETOPHENONE.—7s. 3d. per lb.

AUBEPINE (EX ANETHOL).—10s. 6d. per lb.

AMYL ACETATE.—2s. per lb.

AMYL BUTYRATE.—5s. 6d. per lb.

AMYL SALICYLATE.—3s. per lb.

ANETHOL (M.P. 21/22° C.).—5s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE BENZYL ALCOHOL.—2s per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—2s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL BENZOATE.—2s. 3d. per lb.

CINNAMIC ALDEHYDE NATURAL.—18s. per lb.

COUMARIN.—11s. per lb.

CITRONELLOL.—15s. per lb.

CITRAL.—9s. 6d. per lb.

ETHYL CINNAMATE.—10s. per lb.

ETHYL PHTHALATE.—3s. per lb.

EUGENOL.—9s. 6d. per lb.

GERANIOL (PALMAROSA).—19s. per lb.

GERANIOL.—6s. 6d. to 10s. 6d. per lb.

HELIOTROPINE.—4s. 10d. per lb.

ISO EUGENOL.—13s. 6d. per lb.

LINALOL.—Ex Shui Oil, 12s. per lb. Ex Bois de Rose, 16s. per lb.

LINALYL ACETATE.—Ex Shui Oil, 14s. 6d. per lb. Ex Bois de Rose, 18s. per lb.

METHYL ANTHRANILATE.—9s. per lb.

METHYL BENZOATE.—4s. 6d. per lb.

MUSK KETONE.—36s. per lb.

MUSK XYLOL.—8s. 6d. per lb.

NEROLIN.—3s. 9d. per lb.

PHENYL ETHYL ACETATE.—12s. per lb.

PHENYL ETHYL ALCOHOL.—11s. per lb.

RHODINOL.—28s. 6d. per lb.

SAFROL.—1s. 6d. per lb.

TERPINEOL.—1s. 6d. per lb.

VANILLIN.—19s. per lb.

Essential Oils

ALMOND OIL.—11s. 6d. per lb.

ANISE OIL.—3s. 3d. per lb.

BERGAMOT OIL.—30s. per lb.

BOURBON GERANIUM OIL.—11s. 3d. per lb.

CAMPHOR OIL.—63s. 6d. per cwt.

CANANGA OIL, JAVA.—20s. per lb.

CINNAMON OIL, LEAF.—6d. per oz.

CASSIA OIL, 80/85%.—8s. 9d. per lb.

CITRONELLA OIL.—Java, 85/90%, 2s. 3d. per lb. Ceylon, pure, 1s. 10d. per lb.

CLOVE OIL.—6s. per lb.

EUCALYPTUS OIL, 70/75%.—2s. per lb.

LAVENDER OIL.—Mont Blanc 38/40%, Esters, 20s. 9d. per lb.

LEMON OIL.—9s. 6d. per lb.

LEMONGRASS OIL.—4s. 6d. per lb.

ORANGE OIL, SWEET.—10s. per lb.

OTTO OF ROSE OIL.—Bulgarian, 70s. per oz. Anatolian, 30s. per oz.

PALMA ROSA OIL.—9s. 6d. per lb.

PEPPERMINT OIL.—Wayne County, 22s. per lb. Japanese, 8s. 9d. per lb.

PETITGRAIN OIL.—8s. 3d. per lb.

SANDALWOOD OIL.—Mysore, 26s. per lb. Australian, 17s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, February 17, 1927.

THE uptake of chemicals during the past week has been a little better, but trade is still decidedly on the quiet side. Prices, on the other hand, are remarkably firm and one article after another has improved in value. Export inquiry has been fair, but many of the limits are impracticable.

General Chemicals

ACETONE is a steady market at £57 10s. per ton, for quantities.

ACID ACETIC is in good demand for home trade, but export is quiet.

ACID CITRIC is quiet at 1s. 2d. per lb., and makers are giving indications of approaching higher prices.

ACID FORMIC.—Demand is only fair, but price is firm.

ACID LACTIC is unchanged at £43 per ton, for 50%, by weight.

ACID TARTARIC.—Has advanced in price, and makers are asking 1s. 0¼d. per lb., less 5%, c.i.f. The second hand market is at the moment slightly lower.

ALUMINA SULPHATE is inclined to be easier, price nominally £6 5s. for 17-18%.

AMMONIUM CHLORIDE is in very slow demand at £19 10s. to £19 15s. per ton.

COPPER SULPHATE.—Unchanged at £24 per ton.

CREAM OF TARTAR is very firm at £83 to £84 per ton, and a further advance is expected.

EPSOM SALTS.—Unchanged at about £5 10s. per ton.

FORMALDEHYDE is quiet, but price steady at £42 to £43 per ton.

LEAD ACETATE is firm at £44 10s. to £45 per ton, for white, and £43 per ton for brown. The market tendency is upward.

METHYL ACETONE is firm at about £60 per ton, for high grade material.

METHYL ALCOHOL.—Unchanged at £46 per ton.

POTASSIUM CHLORATE.—Unchanged at 3½d. per lb.

POTASSIUM PERMANGANATE is a nominal market at 7½d. per lb., for B.P.

POTASSIUM PRUSSIATE is firm at 7½d. per lb.

SODA ACETATE.—Has been in better demand and is quoted at £19 to £20 per ton, according to quantity and position.

SODA BICHROMATE.—Unchanged.

SODA HYPOSULPHITE.—Unchanged.

SODA NITRITE is in moderate demand at £19 10s. per ton.

SODA PRUSSIATE is very firm at 4¾d. per lb.

SODA SULPHIDE.—Unchanged.

ZINC SULPHATE.—Unchanged.

Coal Tar Products

The market for coal-tar products is steady, with little change in prices to report from last week.

90's BENZOL is quoted at 1s. 9¼d. per gallon on rails, while the motor quality is quoted at about 1s. 8¾d. per gallon.

PURE BENZOL is worth from 2s. 9d. to 3s. per gallon.

CREOSOTE OIL is quoted at from 7¼d. to 7½d. per gallon, on rails in the country, while the price in London is about 8½d. to 8¾d. per gallon.

CRESYLIC ACID is steady at 2s. per gallon on rails for the pale quality 97/99%, while the dark quality 95/97% is worth about 1s. 11d. per gallon.

SOLVENT NAPHTHA is unchanged, and is quoted at about 1s. 5d. per gallon on rails.

HEAVY NAPHTHA is worth about 1s. 2d. to 1s. 3d. per gallon on rails.

NAPHTHALENES are unchanged, the 76/78 quality being worth about £8 5s. to £8 15s. per ton, while the 74/76 quality is worth about £7 15s. to £8 per ton.

Latest Oil Prices

LONDON.—February 16.—LINSEED OIL firm and 2s. 6d. to 5s. higher. Spot, £32 10s., ex mill. March-April, £32; May-August, £31 15s.; September-December, £32 7s. 6d. RAPE OIL steady. Crude extracted, £46; technical, refined, naked, £48, ex wharf. COTTON OIL, firm. Refined common, edible, £42; Egyptian, crude, £35 10s.; deodorised, £44. TURPENTINE was quiet and occasionally 3d. to 6d. per cwt. lower. American, spot, 47s. 9d. March-April, 48s. 6d.; May-June, 49s. 6d.; and July-December, 50s.

HULL.—February 16.—LINSEED OIL.—Spot and February, £32 5s.; March-April, £32 2s. 6d.; May-August, £32; September-December, £32 7s. 6d. COTTON OIL.—Bombay crude, £34; Egyptian crude, £35 10s.; edible refined, £39; technical, £38; deodorised, £41. PALM KERNEL OIL.—Crushed naked, 5½ per cent., £39 10s. SOYA OIL.—Extracted and crushed, £34 10s.; deodorised, £38. GROUNDNUT OIL.—Crushed-extracted, £43; deodorised, £47. RAPE OIL.—Crude-extracted, £45 10s.; refined, £47 10s. per ton. CASTOR OIL.—Pharmaceutical, 53s. 6d.; firsts, spot, 48s. 6d.; seconds, 46s. 6d. per cwt. net cash terms ex-mill.

Nitrogen Products

Export.—During the last week the demand for sulphate of ammonia has been quiet. British producers continue to make small sales of quantities available on the basis of £11 2s. 6d. per ton, f.o.b. U.K. port, in single bags. News from the Continent and the United States indicates that the usual heavy seasonal demand has set in. About a month ago there was a slight drop in price in the United States, but the market recovered and seems likely to advance.

Home.—It is understood that the frosty weather prevailing during the last week has operated to postpone the farmers' demand for prompt delivery. Merchants are busy in the early consuming districts and have reported that a considerable increase on last year's consumption is likely.

Nitrate of Soda.—Despite the efforts of the Chilian producers to stimulate demand by offering to purchase back 75 per cent. of goods remaining in merchants' possession at the end of the season, the high prices to the consumer tend to make him look round for cheaper forms of nitrogen, and these are not difficult to find. In the United States the market for nitrate seems to be active, but in England and on the Continent it looks as if sulphate is making further inroads into fields hitherto dependent on nitrate. Of course, the consuming season is only beginning, and one can only guess at how far this tendency will operate.

Calcium Cyanamide

THERE is no change to report in prices. Demand is becoming more active with a good inquiry particularly in eastern districts. The present price is £9 14s. per ton, delivered in 4-ton lots, carriage paid to any railway station in Great Britain.

New York Chemical Exposition

THE eleventh annual exposition of chemical industries to be held in Grand Central Palace, New York City, September 26 to October 1, is one of the outstanding features of industry for this year. Plans are progressing and the indications are that many new and interesting features will be exhibited. Prominent among the features will be the following: The Southern Section by States and railroads, showing the raw materials and opportunities of the Southern States; the Canadian Section by Provinces and railroads, showing the raw materials of Canada suitable for industrial development; the Container Section, exhibiting containers used in industry with the machinery for packaging, bottling, and labelling; and a Laboratory Supply and Equipment Section. The sectional exhibits will be supplemented by displays of chemical products, machinery used in manufacture and development, dyes and fine chemicals, as well as instruments of precision, and unit processes developed and in operation.

New "Preservatives in Food" Bill

MR. A. E. JACOB, M.P., introduced in the House of Commons on Wednesday a bill to amend the Sale of Food and Drugs Act (1875-1907), designed to give effect to the recommendation of the Departmental Committee on the use of preservatives and colouring matter, which the Ministry of Health and the Scottish Board of Health have endorsed in a circular to local authorities. The effect of the operative clause in the bill is to make such prohibitions or limitations as are imposed by the regulations binding upon the courts in proceedings taken under the Acts; in other words, to rule out all possibility of conflict of expert evidence on the question whether the amount of preservative, etc., were injurious to health or not, and to make the sole point at issue whether the nature or amount was in contravention of the regulations. The Government is said to approve the bill in principle, and Mr. Jacob hopes to get it through without serious opposition. Mr. J. H. Hayes and Mr. T. D. Fenby are among its supporters.

THE AMOUNT OF ARTIFICIAL SILK subjected to excise duty during the year 1926 was 25,487,551 lb. This is the most reliable index obtainable as to the actual production in the country and an indication of the consumption may therefore be obtained as follows: approximate production, 25,487,551 lb.; retained imports, 1,799,980 lb.; exports, 5,425,496 lb.; approximate consumption, 21,862,035 lb.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

Glasgow, February 16, 1927.

THE heavy chemical market has shown considerable activity during the past week, quite an appreciable amount of business being placed for both spot and forward delivery. Prices on the whole are unchanged, an exception being arsenic which is rather easier.

Industrial Chemicals

ACID ACETIC.—98/100%, £55 to £67 per ton, according to quantity and packing, c.i.f. U.K. ports: 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystal, granulated or small flakes, £34 per ton; powder, £36 per ton, packed in bags carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—In moderate demand and price unchanged at about 6¼d. per lb., delivered or f.o.b. U.K. ports, but this figure could probably be shaded for important quantities.

ACID CITRIC, B.P. CRYSTALS.—Unchanged at 1s. 2¾d. per lb., less 5%, ex store. Offered for early delivery from the Continent at 1s. 2½d. per lb., less 5 %, ex wharf.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality 4s. 9d. per carboy. Dearsenicated quality 6s. 3d. per carboy, ex works.

ACID NITRIC, 80°.—Quoted £23 5s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—Spot material limited and price quoted 4d. per lb., ex store. Offered from the Continent at 3¾d. per lb., ex wharf.

ACID SULPHURIC, 144°.—£3 12s. 6d. per ton; 168°, £7 per ton, ex works, full truck loads. Dearsenicated quality 20s. per ton more.

ACID TARTARIC B.P. CRYSTALS.—In rather poor demand. Spot material now quoted 11¼d. per lb., less 5%, ex store. Offered for early delivery 11¼d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE, 17/18%, IRON FREE.—Spot material on offer at about £6 per ton, ex store. Quoted £5 8s. 6d. per ton, c.i.f. U.K. ports, prompt shipment from the Continent.

ALUM POTASH.—Lump quality quoted at about £8 7s. 6d. per ton, c.i.f. U.K. ports. Crystal powder 5s. per ton less. Spot prices, £9 2s. 6d. and £8 10s. per ton, ex store respectively.

AMMONIA ANHYDROUS.—On offer at 9¾d. per lb., ex store. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powder £39 per ton, packed in 5 cwt. casks delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880°.—Unchanged at about 2½d. to 3d. per lb., delivered according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of English manufacture unchanged at about £23 to £24 per ton, ex station. Continental on offer at £20 15s. per ton, c.i.f. U.K. ports. Fine white crystals of Continental manufacture quoted £18 10s. per ton, c.i.f. U.K. ports.

ARSENIC, WHITE POWDERED.—On offer for early delivery at £19 5s. per ton, ex wharf. Spot material quoted £20 per ton, ex store.

BARIUM CARBONATE, 98/100%.—White powdered quality quoted £6 15s. per ton, c.i.f. U.K. ports.

BARIUM CHLORIDE, 98/100%.—Large white crystals quoted £8 per ton, c.i.f. U.K. ports, packed in bags. Casks 7s. 6d. per ton extra. Offered on spot at about £9 12s. 6d. per ton, ex store.

BARYTES.—English material unchanged at £5 5s. per ton, ex works. Continental quoted £5 per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—Contract price to consumers £8 per ton, ex station, minimum four-ton lots. Spot material 10s. per ton extra. Continental now quoted £7 10s. per ton, c.i.f. U.K. ports.

BORAX.—Granulated, £19 10s. per ton; crystals, £20 per ton; powder, £21 per ton, carriage paid U.K. ports.

CALCIUM CHLORIDE.—English manufacturers' price unchanged at £5 12s. 6d. to £5 17s. 6d. per ton, ex station. Continental rather dearer at £3 17s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works or at £4 12s. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—English material quoted £23 per ton, f.o.b. U.K. ports. Continental on offer at £21 10s. per ton, c.i.f. U.K. ports.

FORMALDEHYDE, 40%.—Quoted £38 10s. per ton, c.i.f. U.K. ports. Spot material available at about £40 per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental now quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—Imported material on offer at about £33 15s. per ton, ex store.

LEAD, WHITE.—Quoted £35 per ton, ex store.

LEAD ACETATE.—White crystals quoted £42 15s. per ton, c.i.f. U.K. ports; brown about £40 5s. per ton, c.i.f. U.K. ports; white crystals on spot quoted £44 5s. per ton, ex store.

MAGNESITE GROUND CALCINED.—Quoted £8 10s. per ton, ex store, in moderate demand.

MAGNESIUM CHLORIDE.—Quoted £6 per ton, c.i.f. U.K. ports.

POTASH, CAUSTIC, 88/92%.—Solid quality unchanged at £27 5s. per ton, c.i.f. U.K. ports, minimum 15-ton lots. Smaller quantities 15s. per ton extra. Liquid, 50° Be, £14 10s. per ton, c.i.f. U.K. ports, minimum 15-ton lots.

POTASSIUM BICHROMATE.—Unchanged at 4½d. per lb., delivered.

POTASSIUM CARBONATE.—96/98%, quoted £25 5s. per ton, ex wharf, early delivery. Spot material on offer at £26 10s. per ton, ex store; 90/94% quality quoted £22 5s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 98/100%.—Powdered quality on offer at £24 5s. per ton, c.i.f. U.K. ports. Crystals £2 per ton extra.

POTASSIUM NITRATE (SALTPETRE).—On offer for prompt shipment from the Continent at £21 5s. per ton, c.i.f. U.K. ports, spot material available at £23 5s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 6¾d. per lb., ex store, spot delivery. On offer for early shipment at 6½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Offered for early delivery at 7¼d. per lb., f.o.b. U.K. ports, spot material. Quoted 7½d. per lb., ex store.

SODA CAUSTIC.—Powder, 98/99%, £19 7s. 6d. per ton; 76/77% £15 10s. per ton; 70/72%, £14 10s. per ton, carriage paid station, minimum four-ton lots on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—English material quoted £22 10s. per ton, ex store. Continental on offer at about £19 per ton, c.i.f. U.K. ports.

SODIUM BICARBONATE.—Refined recrystallised quality £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¼d. per lb., delivered buyers' works.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powder or pea quality, £1 7s. 6d. per ton more; alkali, 59 %, £8 12s. 3d. per ton, ex quay or station.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Continental quality offered at £8 per ton, ex wharf, prompt shipment packed in bags. Casks 10s. per ton extra. Pea crystals, photographic quality of British manufacture quoted £14 10s. per ton, ex station.

SODA NITRATE.—Ordinary quality quoted £13 per ton, ex store. Refined quality, 5s. per ton extra.

SODIUM NITRITE, 100%.—Spot material now quoted £20 5s. per ton, ex store.

SODIUM PRUSSIATE (YELLOW).—Now quoted 4¾d. per lb., ex store, spot delivery. Offered for prompt shipment at 4½d. per lb., ex wharf.

SODIUM SULPHATE (SALTCAKE).—Price for home consumption £3 7s. 6d. per ton, ex works.

SODIUM SULPHIDE.—60/65%, solid, £12 10s. per ton; broken, £13 10s. per ton; flake, £14 10s. per ton; crystals, 31/34%, £8 10s. per ton, and £9 per ton, according to quality delivered buyers' works, minimum four-ton lots on contract. Price for spot, 5s. per ton extra, for solid 2s. 6d. per ton extra, for crystals; 60/62%, solid quality offered from the Continent at about £9 7s. 6d. per ton, c.i.f. U.K. ports; broken 15s. per ton extra.

SULPHUR.—Flowers, £12 10s. per ton; roll, £11 10s. per ton; rock, £11 10s. per ton; floristella, £11 per ton; ground American, £9 15s. per ton, ex store. Prices nominal.

ZINC CHLORIDE.—British material, 98/100%, quoted £24 15s. per ton, f.o.b. U.K. ports; 98/100%, solid on offer from the Continent at about £21 15s. per ton, c.i.f. U.K. ports; powdered 20s. per ton extra.

ZINC SULPHATE.—Continental material on offer at about £10 10s. per ton, ex wharf.

NOTE.—The above prices are for bulk business, and are not to be taken as applicable to small parcels.

Coal Tar Intermediates

ALPHA NAPHTHYLAMINE.—1s. 3d. per lb. Some inquiries.

NAPHTHIONIC ACID.—1s. 8½d. per lb. Some inquiries.

H. ACID.—3s. 3d. per lb. Small inquiries.

BETA NAPHTHOL.—11d. to 1s. per lb. Some inquiries.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, February 17, 1927.

Whilst inquiry for a number of the heavy chemicals on the Manchester market during the past few days has been fairly active, it is still the case that actual business is of relatively limited extent, although it shows an improvement over recent experience, more particularly, of course, as regards home users, export orders on this centre during the past week having been rather quiet. The majority of the leading products keep up at recent values, although there is still a downward tendency to be observed in the case of a number of articles.

Heavy Chemicals

There is a moderate business passing in saltcake and prices here keep steady at from £3 10s. to £3 15s. per ton. Alkali is maintained at £6 15s. per ton and the demand for this material continues on quietly steady lines. In the case of bleaching powder, which is still quoted at £8 per ton, a fair trade is being done. Sulphide of soda attracts comparatively little attention and prices seem somewhat less steady at round £11 per ton for 60-65 per cent. concentrated solid and £8 5s. to £8 10s. for commercial quality. Bichromate of soda is in fair demand and prices are unchanged on the week at 3½d. per lb. Glauber salts are moving off sluggishly and quotations are far from firm, about £3 2s. 6d. per ton now being asked. The demand for caustic soda keeps up at firm prices, these ranging from £14 10s. to £16 10s. per ton, according to quality. Hyposulphite of soda meets with a limited demand at about £10 per ton for commercial material and £15 5s. for photographic. Bicarbonate of soda is well held at its recent level of £10 10s. per ton, and a fair amount of interest is being shown in this. Prussiate of soda is fully maintained at 4¼d. to 4½d. per lb., supplies of this still being on the short side. Nitrite of soda has been on offer this week at about £19 2s. 6d. per ton, and a moderate trade has been put through. Phosphate of soda shows little change on the week at £12 10s. to £12 15s. per ton, but there is only a limited buying interest in this being shown at the present time. Chlorate of soda is a quiet section, but values seem to have steadied somewhat at round 3d. per lb.

Among the potash compounds, caustic is fully maintained at about £29 per ton and a fair inquiry has been reported. Carbonate of potash meets with a quietly steady demand at £26 5s. per ton. Yellow prussiate of potash keeps firm on relatively short supplies at 7¼d. per lb. Chlorate of potash, however, has remained rather dull at about 3⅝d. per lb. There has been no important business put through in the case of permanganate of potash, but prices in this section are held at 4⅞d. per lb. for commercial material and 6d. for B.P. quality. Bichromate of potash is steady at 4⅛d. per lb. and a fair trade is reported.

There is a quiet demand for sulphate of copper and values are steadier again at about £24 12s. 6d. per ton, f.o.b. Offers of arsenic are still not too plentiful and prices keep firm in consequence, about £17 10s. per ton, at the mines, being quoted this week for white powdered, Cornish makes. Acetate of lime continues rather inactive and quotations have an easy tendency at round £8 17s. 6d. per ton for brown material and £15 15s. for grey. Inquiry for nitrate of lead has been rather poor, but prices are about unchanged at £40 per ton. Acetate of lead is attracting only limited attention at £44 10s. per ton for white and £41 for brown.

Acids and Tar Products

In the case of citric acid the demand for this is restricted, but at 1s. 2¾d. per lb. prices have shown little further alteration. Tartaric acid meets with some inquiry and values are steadier at 11¾d. per lb. The demand for acetic acid continues on a fair scale and quotations are maintained at £37 per ton for 80 per cent. commercial and £66 to £67 for glacial. Prompt offers of oxalic acid continue rather scarce and prices remain firm at 3⅞d. to 4d. per lb.

The tendency in the case of the coal-tar products seems to be towards gradually lower levels. Pitch, however, at about £5 10s. per ton has not changed much since last week though current demand is quiet. Carbolic acid crystals meet with some inquiry at about 6¼d. per lb. Solvent naphtha and creosote oil are rather slow at 1s. 7¾d. and 7½d. per gallon, respectively.

German Chemical Propaganda

Attempts to Influence the Geneva Conference

A somewhat subtle attempt to influence the forthcoming International Economic Conference at Geneva in favour of the German chemical industry and to protest against the attempts now being made by other countries to make themselves economically independent in this respect appears to have been made in a monograph on the world's chemical industry that has been prepared by the chemical group of the German Manufacturers' Association for the consideration of the preparatory committee of the Conference. In this document the relative importance of the German industry is emphasised and broad hints are given in favour of "concentration" of manufacturing activities in one country. This applies particularly to the section on coal tar dyes. It is boldly claimed that the early concentration of this industry in Germany was responsible for its development on a major scale. "Only the supplying of the world market as a whole or to an important part," says the memorandum, "could guarantee a turnover in the tar dyes field for which the necessary technical work was economically possible." The Germans are aggrieved by the successful post-war attempts of various countries, including Great Britain, to build up a self-contained tar dye industry, with the result that, on their own admission, the German share of the total production has seriously declined, and there is a disgruntled reference to the "appropriation of public funds" in these rival countries to finance the industries in question.

A rival memorandum has been drafted on behalf of the British industry, and it is probable that the members of the Preparatory Committee will be reminded that, while the concentration of any particular industry is clearly to the advantage of the country concerned, certain other strong considerations apply in the case, for example, of the dyestuffs industry. So long as the great textile industries are dependent upon an adequate supply of dyestuffs, it is essential in fact for this country to provide itself with an industry so necessary to the national welfare, and one, moreover, which provides an exceptional training ground for young chemists. Moreover, the failure of the supplies of German dyes at the outbreak of the European war necessitated the establishment of these rival industries, while the German suggestion that in building up her dyestuff industries during the past 50 years no assistance was given from the State hardly appears to be warranted by the facts. A study of the facts reveals that the progress made by this country in the manufacture of dyestuffs has been more rapid than anyone aware of the difficulties of the industry would have dared to predict.

It is believed to be agreed on the British side that a complete solution of the difficulties will probably be found ultimately only along the lines of international agreements concluded between various national industries when they have sufficiently amalgamated their own interests.

Masks against Chlorine Gas

Chlorine is a poisonous gas considerably used in the chemical industries. It has a greenish yellow colour, a characteristic odour, and a strongly irritant action on the eyes, respiratory passages, and the lungs. Very low percentages are dangerous—such as 0·004 to 0·006 per cent. if inhaled for ½ to 1 hour. A few deep breaths of 0·1 per cent. chlorine may be fatal. It was the first poisonous gas to be used in the war. All-service gas masks, developed by the U.S.A. Bureau of Mines, give very good protection against the gas as well as against hydrocyanic and other acid gases. Fortunately, most of the chemically active gases manifest their presence by irritant action on eyes, nose, and throat, and thus give warning of their presence.

New German Insulating Material

The American Trade Commissioner at Berlin reports that the Glisoma-Werk in Schierstein on the Rhine, formerly known as Landsberg and Ollendorf of Frankfort, is manufacturing a new insulating material known under the trade name of "Peralit." The new product is intended to replace fibre, hard rubber, and other insulating materials. It is built up of layers of certain materials, the nature of which is not reported, and subjected to very high pressure with application of heat. The insulating material has a high electrical resistance, and is said to keep its shape up to 200° C. It is not affected by oil, air, or humidity, but only by certain acids.

Company News

PENNSYLVANIA WATER AND POWER.—It is announced that a dividend of $2 per share on the common shares has been declared for the quarter ending March 31, payable on April 1.

AMERICAN CELLULOSE AND CHEMICAL MANUFACTURING CO., LTD.—The directors have declared a dividend of 1¾ per cent. on the 7 per cent. cumulative first participating preferred stock of the company issued prior to June 30, 1926, payable on March 15.

UNITED TURKEY RED CO.—A dividend of 5 per cent., less tax, is proposed for the year 1926, carrying forward £36,900. No interim dividend payment was made. Last year's payments totalled 10 per cent., less tax, and the carry-forward was £39,000.

EASTMAN KODAK OF NEW JERSEY.—The following dividends have been declared, payable on April 1: Regular dividend of 1¾ per cent. on preferred stock, regular dividend of $1.25 per share on common stock; extra dividend of $0.75 per share on common stock. A similar payment was made in February last year.

TEHIDY MINERALS, LTD.—In their report for 1926, the directors propose a final dividend of 3d. per share, making 9d. per share for the year. The profits have risen from £10,745 in 1925 to £14,082 last year, and after adding the balance brought forward of £10,858 there is available £24,940. The interim dividend amounted to £7,350, and the directors have decided to write off offices, furniture and equipment £95, and off investments £5,665. The sum of £8,155 is to be carried forward.

CANADA CEMENT CO.—For the year ended December 31 last the report states the company's income derived from sources other than manufacture and sale of cement reached $697,041, and there is every prospect of this income continuing to increase. Investments in and advances to other companies have increased by $203,826, which increase is entirely accounted for by company having, during the year, paid in full for stock which it subscribed for in Pennsylvania Gypsum Co., of Chester, Pa. Other investments show a decrease of $625,023, which is accounted for by sale of securities, the proceeds of which have not yet been reinvested and are therefore in current assets as cash. The current assets are $4,215,051, to which is added investments in bonds, giving total current assets of $10,378,836. The total current liabilities are $1,126,533; therefore current assets exceed current liabilities by $9,252,303.

BORAX CONSOLIDATED, LTD.—The report for the year ending September 30 last states that the profits, after providing for all management and administration expenses, are £387,858. The requirements for the debenture interest for the year, the interim dividends on the preference shares and on the preferred ordinary shares paid on May 1, 1926, amounted to £139,641, leaving, with the amount brought forward, £444,847 to be dealt with. The sum of £30,000 has been placed to buildings, plant, etc., depreciation reserve account, and the annual premium of £5,825 to the credit of the debenture stock redemption sinking fund. The directors propose to pay a final dividend of 1s. 3d. per share on the deferred ordinary shares, making 10 per cent. for the year; to place to general reserve £25,000; to income tax reserve accrued to September 30, 1926, £5,000; to pensions and grants fund, £5,000; and to carry forward £219,022. The annual meeting will be held at the Terminus Hotel, Cannon Street, London, on February 23, at 12 noon.

BRADFORD DYERS' ASSOCIATION, LTD.—The profits for the year to December 31 last, after providing an estimated amount in respect of "the employés' bonus register," income-tax, and other contingencies, amount to £550,714, to which was to be added £555,016 brought forward from 1925, making £1,105,730. From this sum have to be deducted interest on debenture stock, £58,150, and depreciation on buildings, plant, and machinery, motor vehicles, furniture, and fixtures, £224,914, leaving £822,666. Out of this have been paid dividends on the preference shares for the year to December 31 last amounting to £125,000 and on the ordinary shares for the half-year to June 30 last at the rate of 1s. per share, amounting to £108,518. It is recommended that a dividend on the ordinary shares at the rate of 1s. per share be paid for the six months to December 31 last (making 2s. per share for the year), and that £480,630 be carried forward. The report was posted to the shareholders on February 16. The annual meeting will be held on February 28, and the dividend on the ordinary shares will be paid on March 7.

Tariff Changes

AUSTRALIA.—H.M. Senior Trade Commissioner at Melbourne has reported that the operation of the deferred duties imposed on acetone and citric acid has been postponed to July 1.

BELGIUM.—As regards the Belgian Royal Decree of October 26, 1926, increasing the coefficients of increase applicable to the Customs duties on certain goods, the Commercial Secretary to H.M. Embassy at Brussels has now ascertained that, in cases where the coefficients fixed by the Decree are higher than those fixed by arrangements which Belgium has concluded with other countries, the Decree overrides these arrangements, in virtue of the clause which they contain permitting the increase of duties if prices in Belgium rise by more than a certain percentage. The increased cofficients resulting from the Decree of October 26, therefore, affect not only the articles referred to, but also pharmaceutical products, etc.

BRITISH INDIA.—Notification No. 73 T (38), issued by the Government of India on December 25, 1926, contains revised tariff valuations of the following among others:—tallow, stearine, wax, manures (all sorts, including animal bones and chemical manures), chemicals, drugs, medicines, dyeing and tanning substances, China Clay, pitch, tar, dammer and Portland cement. For further details of these valuations the *Board of Trade Journal* for February 10 should be consulted.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

WORM KILLER.—A Pittsburgh seed store wishes to be placed in touch with United Kingdom suppliers of a good worm killer for use in connection with golf links. (Reference No. B.X. 3234.)

OILS AND FATS FOR THE SOAP INDUSTRY.—A firm in Duisberg (Germany) desires to represent a British firm. (Reference No. 161.)

YELLOW AND RED OCHRE AND IRON MINIUM.—The Braila Docks Service (Roumania) are calling for tenders, to be presented by March 1, 1927, for the supply of yellow and red ochre and iron minium. (Reference No. B.X. 3239.)

REFINED WHITE OPAQUE PARAFFIN WAX.—The Roumanian State Monopoly Regie is calling for tenders to be presented by March 12, 1927, for the supply of 200,000 kg. of refined white opaque paraffin wax. (Reference No. B.X. 3243.)

VARIOUS PAINTING GOODS.—The Roumanian River Navigation Service is calling for tenders, to be presented by February 25, 1927, for the supply of the following materials:—Zinc white in powder; putty prepared with boiled linseed oil; "iron tar"; lead minium; linseed oil double boiled; red paint (English red), prepared with boiled linseed oil; black paint, prepared with boiled linseed oil; grey paint, prepared with boiled linseed soil. (Reference No. B.X. 3237.)

PHOTOGRAPHIC MATERIALS.—The Egyptian Ministry of the Interior are inviting tenders for the supply of photographic material, including apparatus and accessories, chemicals, plates and papers, and identification films required during the year ending March 31, 1928. Tenders must be received in Cairo by March 16, 1927. (Reference No. B.X. 3240.)

THE BANGOR BRANCH of the Welsh University Guild of Graduates is promoting a scheme to provide a fund of £10,000 for encouraging post graduate research in the university. The money will provide fellowships to the value of £850, and a feature of the scheme is that encouragement will be given to study and research outside the United Kingdom. The members of the Guild number several thousand and it is believed that the £10,000 will soon be forthcoming.

F.21

FIRTH

RESISTANT STEELS FOR CHEMICAL PLANT

Two easily worked steels which resist chemical attack and corrosion

The combined qualities of resistance to atmospheric influence, moisture, sea water, many acids (including nitric), vinegar, and many organic agents, combined with ease in manipulation, are possessed by the two following steels.

FIRTH "STAYBRITE" SILVER STEEL

The new super-rustless and super-malleable steel

Supplied in the form of descaled sheets, strip, plates, bars, structural sections, tubes, wire and castings. Also supplied in large dimensions of varying thickness for plant construction, in condition suitable for specific application.

It is intended to replace the class of material known as "Stainless Iron," over which it offers great advantages.

This new steel has a yield point of about 15 tons per sq. in. and an elongation of 55% to 70%. This exceptional ductility is combined with maximum corrosion resisting qualities, which it possesses to a remarkable degree.

It may be cold pressed to a degree far in advance of the so-called "Stainless Irons," and, moreover, presents no difficulties in manipulation, since it may be welded, brazed, soldered and riveted without trouble.

FIRTH STAINLESS STEEL

Supplied in the form of Bars, Sheets, Wire, Tubes, Forgings, Drop Stampings and Castings.

This steel may be supplied in the hard condition to resist abrasion, or in a condition easily machineable to comply with any specified requirements.

It is specially adapted for all parts where resistance to rusting and staining influence, combined with great mechanical strength, is necessary.

The whole Firth experience of the successful application of Stainless Steels to hundreds of problems similar to yours is at your service

THOS. FIRTH & SONS, LTD., SHEFFIELD

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.]

FARNSWORTH (RICHARD), LTD., Lumsdale Mills, Matlock, bleachers and dyers. (C.C., 19/2/27.) £10 16s. January 11.

WARNEFORD (H. B.) AND CO., LTD., Vulcan Works, Leek Road, Cobridge, Stoke-on-Trent, manufacturing chemists. (C.C., 19/2/27.) £17 16s. 10d. January 3.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ALLIED MAGNESITE INDUSTRIES (EUBOEA), LTD., London, S.W. (M., 19/2/27.) Registered February 4, £10,000 debentures, to F. H. Richmond, 91, Wimpole Street, W., director of public companies; general charge.

BURTON (W.) AND SONS, LTD., Leicester, bleachers. (M., 19/2/27.) Registered February 2, £6,000 mortgage, to Building Society; charged on properties at Leicester. *£8,000. April 14, 1926.

DAMPNEY (J.) AND CO., LTD., Gateshead-on-Tyne, paint manufacturers. (M., 19/2/27.) Registered February 2, £1,200, etc., mortgage, to Building Society, charged on 34, Sussex Street, Middlesbrough. *£5,588 7s. 9d. June 2, 1926.

LEEDS CHEMICAL CLEANING WORKS, LTD. (M., 19/2/27.) Registered February 2, £150 debentures; general charge.

Satisfaction

HEUTHWAITE AND SON, LTD., Leeds, bleachers, etc. (M.S., 19/2/27.) Satisfactions registered January 18, £100, registered May 18, 1914; also registered February 7, all moneys, etc., registered June 4, 1924 (*re* 30, Brudenall Avenue, Leeds).

London Gazette, &c.

Company Winding Up Voluntarily

C. AND E. PICKSTONE, LTD. (C.W.U.V., 19/2/27.) J. E. Pilkington, Chartered Accountant, Midland Bank Chambers, 77, King Street, Manchester, appointed liquidator, February 4. Meeting of creditors at the Chartered Accountants Hall, 60, Spring Gardens, Manchester, on February 23, at 3 p.m.

Bankruptcy Information

MARKHAM, James Hanby, trading as WATSON WALKER and QUICKFALL, Sheepscar Chemical Works, Leeds, manufacturing chemist, and also trading as A. J. BARBOUR AND CO., at Sheepscar Chemical Works, Leeds, as a horticultural chemist. (R.O., 19/2/27.) Receiving order, February 7. Debtor's petition. Public examination, March 22, 10.30 a.m., County Court House, Albion Place, Leeds.

New Companies Registered

RUBSHELL, LTD. Registered February 7. Nom. capital, £100 in £1 shares. Manufacturers, sellers and dealers in acid proof and other paints, etc. Subscribers:—Mrs. M. Adams, 27, Belsize Park Gardens, London, N.W.3, and R. H. Ward.

SOUTH-EASTERN TAR DISTILLERS, LTD., 3, Lincoln's Inn Fields, London, W.C.2. Registered February 14. Nom. capital, £100 in £1 shares. Tar distillers, by-product, coke and patent fuel manufacturers, oil producers, oil refiners or merchants, chemical manufacturers, manufacturers of and dealers in artificial manures, soap, cosmetics and perfume, etc.

THE SHIP CARBON CO. OF GREAT BRITAIN, LTD., Anglorient House, 31/33, Bishopsgate, E.C.2.—Registered as a private company on February 14. Nom. capital, £130,000 in £1 shares (65,000 8 per cent. cumulative preference and 65,000 ordinary). To adopt an agreement between Schift and Co., A.G., of the first part, the Anglo-Oriental and General Investment Trust, Ltd., of the second part, and Charles H. Champion and Co., Ltd., of the third part, and to carry on the business of manufacturers of and dealers in carbon and all substances and materials containing or capable of producing carbon, etc.

G. WADSWORTH AND SON, LTD., Century Works, Hopwood Lane, Halifax. Registered February 7. Nom. capital, £12,000 in £1 shares. To acquire the business of oil and colour merchants and paint and varnish manufacturers carried on by Lily Wadsworth and G. Wadsworth, trustees of the will of the late A. H. Wadsworth, of Portland Street and Century Works, Halifax. Directors are: Mrs. L. Wadsworth, G. Wadsworth and J. Wadsworth.

Chilean Nitrate: New Method of Extraction

ACCORDING to a statement issued in New York by Mr. Daniel Guggenheim, of Guggenheim Brothers, who have large nitrate and copper mining interests in Chile, the Chilean Government can readily avert the economic crisis which is said to be facing that country through the world's increasing use of synthetic nitrate. Mr. Guggenheim says that, provided that the Government will lower the export duties on nitrate, producers, with the aid of revolutionary changes in the method of extraction which are now in operation at the Coya Norte plant of the Anglo-Chilean Consolidated Nitrate Corporation, can put the synthetic product wholly out of competition. These changes, made after ten years of research and experiment, have resulted in the extraction of 90 per cent. of the nitrate content of the caliche or nitrate-bearing rock, where under the old system of hand labour 15 to 25 per cent. of the nitrate-bearing material was left in the ground, and of the nitrate content of the balance only 65 per cent. was recovered. The Coya Norte plant, where mechanical methods entirely are being used, is already demonstrating the success of the new process, and when operated to its full capacity it will have an annual output of 500,000 tons, or much in excess of the largest nitrate plant previously in existence. The Anglo-Chilean Company is not monopolising the results of its engineers' research, but is arranging to give all other producers the benefit of them, and for that purpose Mr. John K. Macgowan, one of the Guggenheim partners, has gone to Chile, to confer with the people interested in the industry.

Benn Brothers' Other Journals

THE CABINET MAKER.—Special Yorkshire Number: Interviews with Furniture Buyers; Organ Building; A Yorkshire Art School and the Furnishing Industry; Housing and Building Exhibition.

THE ELECTRICIAN.—"Methods for Testing the Temperatures of Electric Radiator Wires," by R. N. Gates, A.M.I.E.E.; Annual Dinner of the Institution of Electrical Engineers; Large Power Transformers; Electrical Overseas Trade in January.

THE FRUIT GROWER.—"An Ideal Nursery Heating System," by A. G. Linfield; "Nutrition of Fruit Trees," by T. Wallace; Broadcast Items of Countryside Interest.

GARDENING ILLUSTRATED.—Planting Hardy Fruits in Spring; Apple Growing by Amateurs; Plants of Special Interest at Vincent Square; "Design for a Suburban Garden," by Percy S. Cane.

THE GAS WORLD.—Conferences on the Maintenance of Gas Consuming Appliances; Gas Supply in Australia; Competition Between Gas and Electricity.

THE HARDWARE TRADE JOURNAL.—Birmingham—The Hardware Metropolis; The Rise and Progress of Local Industries; Change in the Brass and Copper Trades; Hollow-ware for World Markets; Next Week's British Industries Fair; New Hardware described.

THE TIMBER TRADES JOURNAL.—Seaworthiness in Stages; Trees of the Black Forest; Oaks—Their Distinguishing Features; Saw and Cutter Service.